

Chevron Environmental Management Company

# 2018 GROUNDWATER AND OPERATION REPORT

Former Unocal Edmonds Bulk Fuel Terminal  
Edmonds, Washington

April 1, 2019



## 2018 GROUNDWATER AND OPERATION REPORT



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## ACRONYMS AND ABBREVIATIONS

2018 GOR	Groundwater and Operation Report
Arcadis	Arcadis U.S., Inc.
CMP	Compliance Monitoring Plan
COC	constituent of concern
cPAHs	carcinogenic polycyclic aromatic hydrocarbons
CUL	cleanup level
DB-1	Detention Basin 1
DMR	discharge monitoring report
DPE	dual-phase extraction
DRO	diesel range organics
Ecology	Washington State Department of Ecology
Final IAWP	Final Interim Action Work Plan
GRO	gasoline range organics
HO	heavy oil range organics
LNAPL	light nonaqueous phase liquid
MNA	monitored natural attenuation
NAVD88	North American Vertical Datum of 1988
NPDES	National Pollutant Discharge Elimination System
OM&M	operation maintenance and monitoring
POC	point of compliance
PSCAA	Puget Sound Clean Air Agency
Site	former Unocal Edmonds Bulk Fuel Terminal, located at 11720 Unoco Road, Edmonds, Washington
TEQ	toxic equivalent
TPH	total petroleum hydrocarbons
USEPA	United States Environmental Protection Agency
WAC	Washington Administrative Code
µg/L	micrograms per liter

## 1. INTRODUCTION

On behalf of Chevron Environmental Management Company, Arcadis U.S., Inc. (Arcadis) prepared this 2018 Groundwater and Operation Report (2018 GOR) for the former Union Oil Company of California (Unocal) Edmonds Bulk Fuel Terminal, located at 11720 Unoco Road in Edmonds, Washington (Site). The Site and surrounding area are shown on Figure 1-1.

This 2018 GOR is written in accordance with the specifications of the Compliance Monitoring Plan (CMP), which is provided as Appendix B of the Draft Cleanup Action Plan (Arcadis 2017c) submitted to the Washington State Department of Ecology (Ecology) on July 31, 2017. The Site is currently under Agreed Order No. DE 4460 (Ecology 2007).

The Site is formally known as Unocal Edmonds Bulk Fuel Terminal 0178 in Ecology's database. Identifiers are:

- Facility Site Identification Number: 2720
- Cleanup Site Identification Number: 5180.

In 2018, Arcadis performed the following activities:

- Quarterly groundwater monitoring events
- Operation of the dual-phase extraction (DPE) remediation system according to the Final Interim Action Work Plan (Final IAWP; Arcadis 2016b) and the National Pollutant Discharge Elimination System (NPDES) Waste Discharge Permit No. WA099100.

The 2018 GOR includes:

- Descriptions of field activities, including any unusual or unexpected events or conditions
- Tables containing groundwater monitoring data, as well as groundwater sample analytical results
- Figures displaying total petroleum hydrocarbons (TPHs), benzene, and total toxic equivalent (TEQ) carcinogenic polycyclic aromatic hydrocarbons (cPAHs) concentrations in the groundwater samples
- Copies of laboratory reports and chain of custody documentation
- Discharge monitoring reports in accordance with NPDES permit requirements.

## 2. SITE DESCRIPTION

The Site, as defined by the Model Toxics Control Act, comprises the areas of the Lower Yard and the former Upper Yard. The Site layout, as well as the areas of the Lower Yard, are shown on Figure 2-1.

The approximately 25-acre former Upper Yard is located south of the Lower Yard (Figure 2-1). Unocal sold the former Upper Yard to Point Edwards, LLC in October 2003 after Ecology confirmed that Unocal had completed cleanup activities in the Upper Yard (Ecology 2003). The Upper Yard was subsequently redeveloped as the Point Edwards condominium complex. The aquifer beneath the Site is considered a site-wide aquifer; therefore, groundwater constituents of concern (COCs) are the same for the former Upper Yard and the Lower Yard. Additionally, points of compliance (POCs) for the former Upper Yard will be monitored at POC monitoring well locations in the Lower Yard.

The approximately 22-acre Lower Yard surrounds the former Upper Yard to the north, east, and west, and is currently owned by Unocal. The Lower Yard is currently a vacant property, with no permanent aboveground structures. A temporary storage shed, concrete pad, and remediation system enclosure are located along lower Unoco Road in the central portion of the Lower Yard. The Lower Yard stormwater system conveys direct precipitation and stormwater to Detention Basin 1 (DB-1).

Willow Creek runs along the northern portion of the western boundary and the entire eastern boundary of the Lower Yard. To the north and northeast of the Lower Yard beyond Willow Creek is Edmonds Marsh, which is a 23-acre freshwater and brackish water marsh. Willow Creek and Edmonds Marsh are directly connected to Puget Sound and are tidally influenced. At high tide, water flows from Puget Sound upstream in Willow Creek into Edmonds Marsh; at low tide, water drains from Edmonds Marsh through Willow Creek into Puget Sound. At its nearest point (the southwest corner of the Lower Yard), the Site is approximately 160 feet from the Puget Sound shoreline. The tidal variations in water levels in Puget Sound also influence groundwater elevations at the site perimeter.



### 3. GROUNDWATER MONITORING

This section discusses the groundwater monitoring program, groundwater cleanup levels, and groundwater sampling events conducted at the Site in 2018.

#### 3.1 Groundwater Monitoring Program

The groundwater monitoring program includes quarterly post-remedial action events. The events include gauging and sampling the interior and perimeter compliance monitoring wells listed in the CMP (Arcadis 2017c), in Table 3-1, and as shown on Figure 3-1. Additionally, the groundwater monitoring program includes gauging monitoring wells in the southeast Lower Yard (MW-108, MW-109, MW-135, MW-136, MW-500, and MW-501), southwest Lower Yard (MW-147, MW-149-R, MW-150, MW-523, and MW-524), and southeast Lower Yard near the Willow Creek fish hatchery (MW-13U, MW-134X, MW-203, MW-527, and MW-528).

Table 3-1. Groundwater Compliance Monitoring Wells

Perimeter Wells	Interior Wells
LM-2	MW-126
MW-8R	MW-143
MW-20R	MW-502
MW-101	MW-503
MW-104	MW-504
MW-129R	MW-505
MW-139R	MW-506
MW-518	MW-507
MW-522	MW-509
MW-530	MW-511
MW-533	MW-512
MW-535	MW-513
	MW-514
	MW-515
	MW-516
	MW-517
	MW-519
	MW-520
	MW-521
	MW-525
	MW-526
	MW-531
	MW-532
	MW-E
	MW-535

The groundwater monitoring program includes gauging the monitoring wells to measure water levels and assess the presence of recoverable light nonaqueous phase liquid (LNAPL) within 2 hours of low tide, according to the tide charts for Edmonds, Washington (obtained from the National Oceanic and Atmospheric Administration), which are provided in Appendix A.<sup>1</sup>

The groundwater monitoring program includes purging and collecting groundwater samples using low-flow methods, monitoring water quality parameters (dissolved oxygen, oxidation-reduction potential, pH, conductivity, and temperature), and submitting groundwater samples to an Ecology-approved laboratory under chain of custody for the analyses described in the CMP (Arcadis 2017c) and summarized below:

- COCs:
  - Benzene by United States Environmental Protection Agency (USEPA) Method 8021B
  - Gasoline range organics (GRO) by Ecology Method NWTPH-Gx
  - Diesel range organics (DRO) and heavy oil range organics (HO) by Ecology Method NWTPH-Dx (after silica gel cleanup)
  - cPAHs by USEPA Method 8270 selected ion monitoring, including benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, and indeno(1,2,3-cd)pyrene.
- Monitored natural attenuation (MNA) parameters:
  - Sulfate and nitrate by USEPA Method 300.0
  - Dissolved methane by USEPA Method RSK 175
  - Dissolved manganese by USEPA Method 200.8 (field filtered)
  - Ferrous iron (Hach® field kits).

Groundwater samples are submitted quarterly for COCs and biannually for MNA parameters.

## 3.2 Groundwater Cleanup Levels

Groundwater cleanup levels (CULs) for the Site are summarized in Table 3-2. Further details regarding CUL identification are provided in the Public Review Draft Final Feasibility Study Report (Arcadis 2017b).

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<sup>1</sup> Available at <https://tidesandcurrents.noaa.gov/noaatidepredictions.html?id=9447427&legacy=1>

Table 3-2. Groundwater Cleanup Levels

Constituents of Concern <sup>1</sup>	Cleanup Levels (as protection of surface water) <sup>1</sup>
TPH <sup>2</sup>	— <sup>4</sup>
Benzene	16 µg/L <sup>5</sup>
Total cPAHs TEQ <sup>3</sup>	0.05 µg/L <sup>6</sup>

**Notes:**

<sup>1</sup> The aquifer beneath the Site is considered a site-wide aquifer; therefore, groundwater COCs and CULs are the same for the former Upper Yard and the Lower Yard.

<sup>2</sup> TPH concentration calculated by summing the concentrations of GRO, DRO, and HO. For results that do not exceed method reporting limits, one-half of the reporting limit is added to determine TPH concentration.

<sup>3</sup> Total cPAHs calculated by summing the concentrations of benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, and indeno(1,2,3-cd)pyrene; and are adjusted for toxicity using toxic equivalency factors to represent a total benzo(a)pyrene concentration (Washington Administrative Code [WAC] 173-340-900). For results that do not exceed method reporting limits, one-half of the reporting limit is added to determine the total cPAHs concentration.

<sup>4</sup> Method A (WAC 173-340-900, Table 720-1); TPH calculated on a sample-specific basis. The CUL will fall between 500 and 800 micrograms per liter (µg/L), depending on the sample's composition.

<sup>5</sup> National Recommended Water Quality Criteria for human-health (organisms only) (USEPA 2015).

<sup>6</sup> Total cPAHs TEQ adjusted for practical quantitation limit based on WAC 173-340-730(5)(c).

### 3.3 2018 Groundwater Sampling Events

#### 3.3.1 Field Activities

Arcadis performed the following quarterly groundwater sampling events in 2018:

- First quarter: March 19 to 23
- Second quarter: June 25 to 29
- Third quarter: September 17 to 21
- Fourth quarter: November 26 to 30.

Gauging was implemented per the groundwater monitoring program described in Section 3.1. The depths to groundwater in monitoring wells were measured on March 19, June 26, September 21, and November 26, within a 2- to 3-hour window during low tide, according to the tide charts for Edmonds presented in Appendix A.

Sampling was conducted per the groundwater monitoring program described in Section 3.1. Groundwater samples were submitted to Lancaster Laboratories Environmental, an Ecology-approved laboratory, under chain of custody and were analyzed in accordance with the methods described in Section 3.1.

Groundwater field notes are provided in Appendix B.

### 3.3.2 Groundwater Elevation and Flow Direction

Groundwater elevations throughout the Lower Yard remained consistent from October 2008 to November 2018, with average groundwater elevations ranging between 5 and 9 feet above North American Vertical Datum of 1988 (NAVD 88) excluding data for the southeast Lower Yard, which indicate the presence of an area of localized groundwater mounding (with average groundwater elevations ranging between 9 and 11 feet above NAVD 88 and groundwater elevations in monitoring wells MW-500 and MW-501 generally observed several feet higher than nearby wells). In general, the seasonal variation includes the difference between the highest groundwater elevations observed during January and the lowest groundwater elevations observed between June and September.

Historically observed groundwater gradient is to the north-northwest in the central portion of the Site (Central Lower Yard) and to the northwest in the western portion of the Site (Western Boundary, West/Northwest Lower Yard, and Southwest Lower Yard). Using the quarterly water-level data from October 2008 to June 2012 to calculate a site-wide gradient (Devlin 2003), the analysis indicates that the overall average gradient is 0.002 foot per foot toward the west-northwest.

Observed depth to water and groundwater elevations observed in 2018 are presented in Table 3-3. Groundwater elevations and contours are presented on the figures in Appendix C. Interpreted groundwater flow direction were generally to the west-northwest for the Site with local variations: direction varying from north to west in the central portion of the Site (Central Lower Yard), to the northwest in the western portion of the Site (Western Boundary, West/Northwest Lower Yard, and Southwest Lower Yard) and a mounding effect was observed in the southeast Lower Yard. The 2018 groundwater flow directions are consistent with historical data. No LNAPL was encountered at the Site during any of the 2018 sampling events.

### 3.3.3 Analytical Results

Thirty of the 37 POC monitoring wells contained COC concentrations less than their respective CULs. Analytical results are presented in Tables 3-4 and 3-5. COC concentrations are presented on the figures in Appendix C. Figures 3-2 and 3-3 show the Site groundwater remediation status as of fourth quarter 2018. Low-flow sampling field notes are included in Appendix B. Groundwater laboratory analytical reports and chain of custody documents are included in Appendix D. Data validation memorandums are provided in Appendix E.

#### 3.3.3.1 Constituent of Concern Concentrations

COC concentrations greater than their respective CULs are listed below:

- First quarter:
  - *TPH*. MW-129R, MW-525, and MW-526 contained TPH concentrations of 1,980, 1,000, and 2,060 µg/L, respectively.
  - *Benzene*. No exceedances were observed.
  - *cPAHs*. LM-2 contained a cPAHs TEQ concentration of 0.109 µg/L.

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- Second quarter:
  - *TPH*. LM-2, MW-518, MW-525, and MW-526 contained TPH concentrations of 730, 764, 1,073 and 1,103 µg/L, respectively.
  - *Benzene*. No exceedances were observed.
  - *cPAHs*. No exceedances were observed.
- Third quarter:
  - *TPH*. MW-526 and MW-E-R contained TPH concentrations of 789 and 920 µg/L, respectively.
  - *Benzene*. No exceedances were observed.
  - *cPAHs*. No exceedances were observed.
- Fourth quarter:
  - *TPH*. MW-101, MW-129R, MW-518, MW-526, and MW-E-R contained TPH concentrations of 973, 712, 919, 10,284, and 1,155 µg/L, respectively.
  - *Benzene*. No exceedances were observed.
  - *cPAHs*. No exceedances were observed.

On February 7, 2019, a limited event was conducted to confirm results observed during fourth quarter 2018 for MW-101, MW-129R, MW-518, MW-526, and MW-E-R; results are summarized below:

- *TPH*. MW-E-R contained TPH concentrations of 850 µg/L.
- *Benzene*. No exceedances were observed.
- *cPAHs*. No exceedances were observed.

### 3.3.3.2 Monitored Natural Attenuation Parameters

Thirty-four of the 37 POCs during the June 2018 event contained methane concentrations greater than detection limits (3 µg/L) and 20 of those POCs contained methane concentrations greater than 100 µg/L, suggesting degradation of organic constituents.

Twenty-four of the 37 POCs during the November 2018 event contained methane concentrations greater than detection limits (3 µg/L) and 12 of those POCs contained methane concentrations greater than 100 µg/L, suggesting degradation of organic constituents.

## 4. REMEDIATION SYSTEM

This section discusses the remediation system operations conducted at the Site in 2018.

### 4.1 Remediation System Background

The DPE system was installed in 2017 to address remaining impacts near the Washington State Department of Transportation stormwater line, as discussed in the Engineering Design Report and the Final IAWP (Arcadis 2016a, 2016b). Construction details for the DPE system are described in the Dual-Phase Extraction System As-Built Report (Arcadis 2018).

Treated water from the DPE system is discharged to Willow Creek at Outfall #002 under NPDES Waste Discharge Permit No. WA0991007. This permit requires the collection of discharge water samples weekly at Outfall #002 during system operation and submittal of the discharge water samples to an Ecology-approved laboratory for the following analyses:

- Benzene by USEPA Method 624
- GRO by Ecology Method NWTPH-Gx
- DRO by Ecology Method NWTPH-Dx (after silica gel cleanup)
- cPAHs by USEPA Method 625
- pH by pH meter onsite.

NPDES Waste Discharge Permit No. WA0991007, effective since November 1, 2016, requires discharge monitoring reports (DMRs; provided in Appendix F) to be entered by the 28<sup>th</sup> day of each month, starting December 28, 2016, into Ecology's online system WQebDMR.

Treated effluent vapors from the DPE system are discharged under the Puget Sound Clean Air Agency (PSCAA) Permit No.29892 per the permit restrictions and conditions.

### 4.2 2018 Remediation System Operation

The DPE system startup began on December 1, 2017 with the groundwater extraction components in operation. The SVE portion of the DPE system commenced on December 5, 2017 to allow for groundwater drawdown within the radius of influence prior to vacuum application.

From December 1, 2017 through December 31, 2018, the following activities related to DPE system operation were performed:

- Arcadis conducted DPE system operation, maintenance, and monitoring (OM&M) according to the Dual-Phase Extraction System Operation, Maintenance, and Monitoring Manual (Arcadis 2017a). As part of the DPE system OM&M, Arcadis gauged the observation and DPE wells to assess drawdown.

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Potentiometric surface maps showing drawdown from November 28, 2017 to November 13, 2018 are presented in Appendix G.<sup>2</sup>

- Arcadis field technicians observed that the casing in DPE-12 had been compromised during well installation activities, preventing DPE-12 from functioning as designed. A down-hole camera was used to confirm the well casing was broken. On March 22, 2018, DPE-12 was decommissioned by overdrilling and replaced by DPE-12R which was installed approximately 4 feet to the west. The DPE-12 decommissioning log and DPE-12R boring log are presented in Appendix H.
- Arcadis monitored the discharged treated water by collecting samples and the discharged vapor from the DPE system by using a photo ionization detector (PID) (see Section 4.3).

Groundwater and vapor extraction data are presented in Tables 4-1 and 4-2. Vapor extraction laboratory data and mass removal calculations are presented in Table 4-3. Individual DPE well groundwater and vapor data are presented in Tables 4-4 and 4-5. Observation well data are presented in Table 4-6. Catalytic oxidizer data are presented in Table 4-7.

The 2018 DPE system operation is summarized below:

<b>System startup date:</b>	12/01/2017
<b>Remedial technology:</b>	Dual-phase extraction and treatment system
<b>System operation:</b>	Operation from 12/01/2017 to 12/31/2018 (not continuous).
<b>System OM&amp;M schedule:</b>	OM&M was scheduled according to Dual-Phase Extraction System Operation Maintenance and Monitoring Manual (Arcadis. 2017a)
<b>NPDES permit conditions met:</b>	Yes
<b>PSCAA permit conditions met:</b>	Yes
<b>Total volume treated (gallons):</b>	5,313,850
<b>Approximate total vapor-phase mass removed:</b>	
<b>field data (PID):</b>	470 pounds volatile organic compounds
<b>analytical data:</b>	630 pounds GRO

### 4.3 2018 Effluent Discharge

#### 4.3.1 2018 Water Discharge

DPE system groundwater startup was conducted on December 1, 2017. The DPE system began treating and discharging groundwater into DB-1 on December 1, 2017. DPE system water was temporarily held in DB-1 until receipt of analytical results confirming the effectiveness of the DPE system. OUTFALL#002 sample was collected on December 1, 2017, prior to the first discharge into Willow Creek, and results showed compliance with the NPDES Waste Discharge Permit No. WA0991007 allowing discharge into

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<sup>2</sup> The November 28, 2017 gauging event is considered the baseline event prior to DPE system startup.

Willow Creek. Discharge into Willow Creek at Outfall #002 under NPDES Waste Discharge Permit No. WA0991007 was implemented from December 14, 2017 through December 31, 2018. Sampling was implemented weekly from December 5, 2017 to December 27, 2018 for the analytical program described in Section 4.1. If the discharge was suspended for a given week, the associated sampling event was suspended accordingly. DPE system treated water discharge analytical data and field parameters are presented in Table 4-8.

DMRs are presented in Appendix F. Outfall #002 laboratory analytical results and chain-of-custody documents are included in Appendix I. DPE system vapor laboratory analytical reports and chain-of-custody documents are included in Appendix J. DPE system data validation memorandums are provided under Appendix K.

### **4.3.2 2018 Vapor Discharge**

The DPE system soil vapor extraction effective startup was initiated on December 11, 2017 after a startup testing beginning December 5, 2017.

On December 13, 2017, an effluent air sample was collected from the catalytic oxidizer using 1-liter Tedlar® bags and a PID was used to confirm compliance with PSCAA Permit No. 29892. Additionally, vapor samples were collected on December 14, 2017 to confirm the effectiveness of the DPE vapor extraction system. The field readings and laboratory results confirmed compliance with PSCAA Permit No. 29892, allowing discharge.

Pre- and post-treatment effluent vapor monitoring under PSCAA Permit No. 29892 was implemented from December 11, 2017 through December 31, 2018. Monitoring was implemented weekly from December 11, 2017 to November 21, 2018 per the permit restrictions and conditions. If the discharge was suspended, the associated monitoring event was suspended accordingly. All post-treatment vapor discharge concentrations, discharge flow, and treatment temperatures met permit conditions during 2018. Vapor discharge results are summarized in Table 4-7.



## 5. REFERENCES

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# TABLES



**Table 3-3**  
**Groundwater Elevation Data**  
**Former Unocal Edmonds Bulk Fuel Terminal**  
**11720 Unoco Road**  
**Edmonds, Washington**

Monitoring Well	Date	Time	Top of Casing Elevation (feet)	Depth to Water (top of casing) (feet)	Depth to LNAPL (feet)	LNAPL Thickness (feet)	Groundwater Elevation (feet amsl)	Comment
LM-2	10/20/08	16:08	8.14	2.66	--	NP	5.48	--
LM-2	12/08/08	10:51	8.14	2.89	--	NP	5.25	--
LM-2	02/20/09	9:55	8.14	2.64	--	NP	5.50	--
LM-2	04/20/09	9:48	8.14	2.46	--	NP	5.68	--
LM-2	06/22/09	11:35	8.14	2.84	--	NP	5.30	--
LM-2	08/03/09	11:18	8.14	3.10	--	NP	5.04	--
LM-2	08/17/09	9:27	8.14	3.09	--	NP	5.05	--
LM-2	10/29/09	9:46	8.14	2.56	--	NP	5.58	--
LM-2	01/18/10	13:47	8.14	2.59	--	NP	5.55	--
LM-2	04/19/10	15:14	8.14	2.20	--	NP	5.94	--
LM-2	07/19/10	7:24	8.14	2.41	--	NP	5.73	--
LM-2	10/25/10	14:02	8.14	1.63	--	NP	6.51	--
LM-2	03/21/11	12:32	8.14	1.60	--	NP	6.54	--
LM-2	06/14/11	10:54	8.14	2.54	--	NP	5.60	--
LM-2	09/26/11	10:59	8.14	2.79	--	NP	5.35	--
LM-2	12/12/11	12:42	8.14	2.46	--	NP	5.68	--
LM-2	03/27/12	14:09	8.14	1.71	--	NP	6.43	--
LM-2	06/27/12	17:14	8.14	1.98	--	NP	6.16	--
LM-2	09/25/12	7:40	8.14	2.51	--	NP	5.63	--
LM-2	12/13/12	10:15	8.14	1.68	--	NP	6.46	--
LM-2	03/25/13	10:20	8.14	1.17	--	NP	6.97	--
LM-2	06/24/13	12:45	8.14	1.66	--	NP	6.48	--
LM-2	09/23/13	13:55	8.14	2.36	--	NP	5.78	--
LM-2	12/16/13	11:33	8.14	1.86	--	NP	6.28	--
LM-2	03/26/14	8:15	8.14	1.94	--	NP	6.20	--
LM-2	06/16/14	13:11	8.14	2.04	--	NP	6.10	--
LM-2	09/29/14	14:58	8.14	2.29	--	NP	5.85	--
LM-2	12/08/14	12:15	8.14	1.90	--	NP	6.24	--
LM-2	03/23/15	14:51	8.14	2.13	--	NP	6.01	--
LM-2	06/22/15	15:48	8.14	2.50	--	NP	5.64	--
LM-2	10/27/16	9:26	8.14	1.62	--	NP	6.52	--
LM-2	07/24/17	11:40	8.14	1.62	--	NP	6.52	--
LM-2	03/19/18	13:30	8.14	1.70	--	NP	6.44	--
LM-2	06/26/18	10:11	8.14	1.92	--	NP	6.22	--
LM-2	09/21/18	8:41	8.14	2.60	--	NP	5.54	--
LM-2	11/26/18	13:11	8.14	1.22	--	NP	6.92	PID: 0.6
MW-E	10/20/08	16:20	14.42	7.95	--	NP	6.47	--
MW-E	12/08/08	11:35	14.42	7.78	--	NP	6.64	--
MW-E	02/20/09	10:27	14.42	7.58	--	NP	6.84	--
MW-E	04/20/09	10:11	14.42	7.48	--	NP	6.94	--
MW-E	06/22/09	12:14	14.42	7.94	--	NP	6.48	--
MW-E	08/03/09	11:32	14.42	8.10	--	NP	6.32	--
MW-E	08/17/09	9:39	14.42	8.19	--	NP	6.23	--
MW-E	10/29/09	8:53	14.42	7.02	--	NP	7.40	--
MW-E	01/18/10	13:45	14.42	6.89	--	NP	7.53	--
MW-E	04/19/10	15:39	14.42	7.10	--	NP	7.32	--
MW-E	07/19/10	7:41	14.42	7.65	--	NP	6.77	--
MW-E	10/25/10	14:14	14.42	7.30	--	NP	7.12	--
MW-E	03/21/11	12:44	14.42	6.58	--	NP	7.84	--
MW-E	06/14/11	11:15	14.42	7.57	--	NP	6.85	--
MW-E	09/26/11	11:06	14.42	7.93	--	NP	6.49	--
MW-E	12/12/11	12:41	14.42	7.45	--	NP	6.97	--
MW-E	03/27/12	14:24	14.42	6.71	--	NP	7.71	--
MW-E	06/27/12	17:26	14.42	7.19	--	NP	7.23	--
MW-E	09/25/12	8:03	14.42	7.82	--	NP	6.60	--
MW-E	12/13/12	10:15	14.42	6.68	--	NP	7.74	--
MW-E	03/25/13	10:37	14.42	6.82	--	NP	7.60	--
MW-E	06/24/13	12:06	14.42	7.29	--	NP	7.13	--
MW-E	09/23/13	14:05	14.42	7.58	--	NP	6.84	--
MW-E	12/16/13	10:43	14.42	7.46	--	NP	6.96	--
MW-E	03/26/14	8:26	14.42	6.99	--	NP	7.43	--
MW-E	06/16/14	13:54	14.42	7.42	--	NP	7.00	--
MW-E	09/29/14	15:55	14.42	7.46	--	NP	6.96	--
MW-E	12/08/14	12:45	14.42	6.84	--	NP	7.58	--
MW-E	03/23/15	13:59	14.42	7.09	--	NP	7.33	--
MW-E	06/22/15	15:17	14.42	7.66	--	NP	6.76	--
MW-E	10/27/16	9:58	14.42	6.67	--	<0.01	7.75	Film observed during gauging, confirmed with bailer
MW-E	07/24/17	12:45	14.42	7.29	--	NP	7.13	--
MW-E-R	03/19/18	12:43	14.30	6.89	--	NP	7.41	--
MW-E-R	06/26/18	10:20	14.30	7.41	--	NP	6.89	--
MW-E-R	09/21/18	8:17	14.30	7.35	--	NP	6.95	--
MW-E-R	11/26/18	12:27	14.30	6.93	--	NP	7.37	--
MW-E-R	02/07/19	10:05	14.30	7.10	--	NP	7.20	Not part of the quarterly monitoring program; gauged out of low tide window

**Table 3-3**  
**Groundwater Elevation Data**  
**Former Unocal Edmonds Bulk Fuel Terminal**  
**11720 Unoco Road**  
**Edmonds, Washington**

Monitoring Well	Date	Time	Top of Casing Elevation (feet)	Depth to Water (top of casing) (feet)	Depth to LNAPL (feet)	LNAPL Thickness (feet)	Groundwater Elevation (feet amsl)	Comment
MW-8R	10/20/08	15:47	13.82	8.49	--	NP	5.33	--
MW-8R	12/08/08	10:17	13.82	8.35	--	NP	5.47	--
MW-8R	02/20/09	9:22	13.82	8.11	--	NP	5.71	--
MW-8R	04/20/09	9:09	13.82	8.40	--	NP	5.42	--
MW-8R	06/22/09	11:13	13.82	7.06	--	NP	6.76	--
MW-8R	08/03/09	10:53	13.82	8.21	--	NP	5.61	--
MW-8R	08/17/09	8:53	13.82	8.45	--	NP	5.37	--
MW-8R	10/29/09	8:43	13.82	7.99	--	NP	5.83	--
MW-8R	01/18/10	13:21	13.82	6.02	--	NP	7.80	--
MW-8R	04/19/10	14:29	13.82	7.64	--	NP	6.18	--
MW-8R	07/19/10	6:58	13.82	8.37	--	NP	5.45	--
MW-8R	10/25/10	13:31	13.82	7.83	--	NP	5.99	--
MW-8R	03/21/11	12:16	13.82	6.92	--	NP	6.90	--
MW-8R	06/14/11	9:58	13.82	8.13	--	NP	5.69	--
MW-8R	09/26/11	10:48	13.82	8.35	--	NP	5.47	--
MW-8R	12/12/11	11:39	13.82	8.39	--	NP	5.43	--
MW-8R	03/27/12	13:47	13.82	7.39	--	NP	6.43	--
MW-8R	06/27/12	16:37	13.82	8.04	--	NP	5.78	--
MW-8R	09/25/12	7:30	13.82	8.46	--	NP	5.36	--
MW-8R	12/13/12	9:49	13.82	7.24	--	NP	6.58	--
MW-8R	03/25/13	9:56	13.82	8.25	--	NP	5.57	--
MW-8R	06/24/13	11:19	13.82	8.13	--	NP	5.69	--
MW-8R	09/23/13	13:28	13.82	8.02	--	NP	5.80	--
MW-8R	12/16/13	9:35	13.82	8.58	--	NP	5.24	--
MW-8R	03/26/14	7:45	13.82	7.83	--	NP	5.99	--
MW-8R	06/16/14	13:16	13.82	8.16	--	NP	5.66	--
MW-8R	09/29/14	13:26	13.82	7.62	--	NP	6.20	--
MW-8R	12/08/14	12:00	13.82	7.21	--	NP	6.61	--
MW-8R	03/23/15	13:07	13.82	8.53	--	NP	5.29	--
MW-8R	06/22/15	15:11	13.82	8.33	--	NP	5.49	--
MW-8R	10/27/16	8:48	13.82	7.02	--	NP	6.80	--
MW-8R	07/24/17	11:31	13.82	8.31	--	NP	5.51	--
MW-8R	03/19/18	12:13	13.82	7.98	--	NP	5.84	--
MW-8R	06/26/18	9:50	13.82	8.56	--	NP	5.26	--
MW-8R	09/21/18	8:37	13.82	8.44	--	NP	5.38	--
MW-8R	11/26/18	12:37	13.82	7.85	--	NP	5.97	--
MW-101	10/20/08	15:55	14.99	8.97	--	NP	6.02	--
MW-101	12/08/08	10:30	14.99	8.96	--	NP	6.03	--
MW-101	02/20/09	9:40	14.99	8.81	--	NP	6.18	--
MW-101	04/20/09	9:15	14.99	8.83	--	NP	6.16	--
MW-101	06/22/09	11:27	14.99	8.95	--	NP	6.04	--
MW-101	08/03/09	11:03	14.99	9.14	--	NP	5.85	--
MW-101	08/17/09	9:18	14.99	9.38	--	NP	5.61	--
MW-101	10/29/09	9:00	14.99	8.71	--	NP	6.28	--
MW-101	01/18/10	13:30	14.99	7.00	--	NP	7.99	--
MW-101	04/19/10	14:43	14.99	8.31	--	NP	6.68	--
MW-101	07/19/10	7:10	14.99	9.08	--	NP	5.91	--
MW-101	10/25/10	13:39	14.99	8.55	--	NP	6.44	--
MW-101	03/21/11	12:23	14.99	7.85	--	NP	7.14	--
MW-101	06/14/11	10:07	14.99	8.79	--	NP	6.20	--
MW-101	09/26/11	10:50	14.99	9.13	--	NP	5.86	--
MW-101	12/12/11	11:56	14.99	9.82	--	NP	5.17	--
MW-101	03/27/12	13:52	14.99	8.06	--	NP	6.93	--
MW-101	06/27/12	16:53	14.99	8.79	--	NP	6.20	--
MW-101	09/25/12	7:28	14.99	9.39	--	NP	5.60	--
MW-101	12/13/12	10:06	14.99	7.95	--	NP	7.04	--
MW-101	03/25/13	10:06	14.99	8.01	--	NP	6.98	--
MW-101	06/24/13	11:27	14.99	8.86	--	NP	6.13	--
MW-101	09/23/13	13:37	14.99	8.76	--	NP	6.23	--
MW-101	12/16/13	11:40	14.99	9.20	--	NP	5.79	--
MW-101	03/26/14	7:45	14.99	8.19	--	NP	6.80	--
MW-101	06/16/14	13:24	14.99	8.91	--	NP	6.08	--
MW-101	09/29/14	13:42	14.99	8.72	--	NP	6.27	--
MW-101	12/08/14	12:20	14.99	8.01	--	NP	6.98	--
MW-101	03/23/15	13:22	14.99	8.24	--	NP	6.75	--
MW-101	06/22/15	15:22	14.99	9.14	--	NP	5.85	--
MW-101	10/27/16	9:03	14.99	7.88	--	NP	7.11	--
MW-101	07/24/17	11:44	14.99	8.99	--	NP	6.00	--
MW-101	03/19/18	12:29	14.99	8.64	--	NP	6.35	--
MW-101	06/26/18	10:07	14.99	9.41	--	NP	5.58	--
MW-101	09/21/18	9:04	14.99	9.17	--	NP	5.82	--
MW-101	11/26/18	12:54	14.99	8.69	--	NP	6.30	PID: 0.1
MW-101	02/07/19	12:34	14.99	8.65	--	NP	6.34	Not part of the quarterly monitoring program; gauged out of low tide window

**Table 3-3**  
**Groundwater Elevation Data**  
**Former Unocal Edmonds Bulk Fuel Terminal**  
**11720 Unoco Road**  
**Edmonds, Washington**

Monitoring Well	Date	Time	Top of Casing Elevation (feet)	Depth to Water (top of casing) (feet)	Depth to LNAPL (feet)	LNAPL Thickness (feet)	Groundwater Elevation (feet amsl)	Comment
MW-104	10/20/08	15:53	14.08	8.21	--	NP	5.87	--
MW-104	12/08/08	10:28	14.08	8.20	--	NP	5.88	--
MW-104	02/20/09	9:34	14.08	8.09	--	NP	5.99	--
MW-104	04/20/09	9:13	14.08	8.32	--	NP	5.76	--
MW-104	06/22/09	11:24	14.08	8.41	8.40	0.01^	5.67	Measurement error. See note^.
MW-104	08/03/09	11:02	14.08	8.51	--	NP	5.57	--
MW-104	08/17/09	9:17	14.08	8.80	--	NP	5.28	--
MW-104	10/29/09	8:59	14.08	8.12	--	NP	5.96	--
MW-104	01/18/10	13:29	14.08	6.24	--	NP	7.84	--
MW-104	04/19/10	14:40	14.08	7.77	--	NP	6.31	--
MW-104	07/19/10	7:08	14.08	8.47	--	NP	5.61	--
MW-104	10/25/10	13:37	14.08	7.74	--	NP	6.34	--
MW-104	03/21/11	12:21	14.08	7.11	--	NP	6.97	--
MW-104	06/14/11	10:04	14.08	8.26	--	NP	5.82	--
MW-104	09/26/11	10:47	14.08	8.50	--	NP	5.58	--
MW-104	12/12/11	11:48	14.08	8.15	--	NP	5.93	--
MW-104	03/27/12	13:50	14.08	7.39	--	NP	6.69	--
MW-104	06/27/12	16:49	14.08	8.09	--	NP	5.99	--
MW-104	09/25/12	7:26	14.08	8.78	--	NP	5.30	--
MW-104	12/13/12	10:04	14.08	7.21	--	NP	6.87	--
MW-104	03/25/13	10:04	14.08	8.13	--	NP	5.95	--
MW-104	06/24/13	11:25	14.08	8.19	--	NP	5.89	--
MW-104	09/23/13	13:35	14.08	7.99	--	NP	6.09	--
MW-104	12/16/13	10:03	14.08	8.45	--	NP	5.63	--
MW-104	03/26/14	7:40	14.08	7.55	--	NP	6.53	--
MW-104	06/16/14	13:22	14.08	8.24	--	NP	5.84	--
MW-104	09/29/14	13:33	14.08	7.99	--	NP	6.09	--
MW-104	12/08/14	12:18	14.08	7.30	--	NP	6.78	--
MW-104	03/23/15	13:23	14.08	7.58	--	NP	6.50	--
MW-104	06/22/15	15:22	14.08	8.46	--	NP	5.62	--
MW-104	10/27/16	9:02	14.08	7.12	--	NP	6.96	--
MW-104	07/24/17	11:43	14.08	8.35	--	NP	5.73	--
MW-104	03/19/18	12:27	14.08	7.99	--	NP	6.09	--
MW-104	06/26/18	10:00	14.08	8.71	--	NP	5.37	--
MW-104	09/21/18	9:02	14.08	8.54	--	NP	5.54	--
MW-104	11/26/18	12:53	14.08	7.82	--	NP	6.26	PID: 0.2
MW-108	10/20/08	16:11	12.40	6.31	--	NP	6.09	--
MW-108	12/08/08	10:59	12.40	7.80	--	NP	4.60	--
MW-108	02/20/09	9:58	12.40	6.54	--	NP	5.86	--
MW-108	04/20/09	9:51	12.40	6.48	--	NP	5.92	--
MW-108	06/22/09	11:38	12.40	6.68	--	NP	5.72	--
MW-108	08/03/09	11:20	12.40	6.75	--	NP	5.65	--
MW-108	08/17/09	9:29	12.40	6.80	--	NP	5.60	--
MW-108	10/29/09	9:43	12.40	7.45	--	NP	4.95	--
MW-108	01/18/10	13:49	12.40	6.42	--	NP	5.98	--
MW-108	04/19/10	15:16	12.40	6.07	--	NP	6.33	--
MW-108	07/19/10	7:27	12.40	6.42	--	NP	5.98	--
MW-108	10/25/10	13:58	12.40	5.66	--	NP	6.74	--
MW-108	03/21/11	12:34	12.40	5.81	--	NP	6.59	--
MW-108	06/14/11	10:49	12.40	6.38	--	NP	6.02	--
MW-108	09/26/11	9:27	12.40	6.56	--	NP	5.84	--
MW-108	12/12/11	12:47	12.40	6.37	--	NP	6.03	--
MW-108	03/27/12	14:11	12.40	5.91	--	NP	6.49	--
MW-108	06/27/12	17:19	12.40	6.03	--	NP	6.37	--
MW-108	09/25/12	7:43	12.40	6.49	--	NP	5.91	--
MW-108	12/13/12	10:06	12.40	5.76	--	NP	6.64	--
MW-108	03/25/13	11:30	12.40	5.52	--	NP	6.88	--
MW-108	06/24/13	12:48	12.40	5.91	--	NP	6.49	--
MW-108	09/23/13	13:58	12.40	6.25	--	NP	6.15	--
MW-108	12/16/13	11:37	12.40	6.45	--	NP	5.95	--
MW-108	03/26/14	8:17	12.40	5.80	--	NP	6.60	--
MW-108	06/16/14	13:10	12.40	6.05	--	NP	6.35	--
MW-108	09/29/14	14:45	12.40	6.23	--	NP	6.17	--
MW-108	12/08/14	12:20	12.40	6.03	--	NP	6.37	--
MW-108	03/23/15	14:59	12.40	6.03	--	NP	6.37	--
MW-108	06/22/15	15:49	12.40	6.44	--	NP	5.96	--
MW-108	10/27/16	10:16	12.40	6.05	--	NP	6.35	--
MW-108	07/24/17	11:25	12.40	7.08	--	NP	5.32	--
MW-108	03/19/18	13:38	12.40	5.81	--	NP	6.59	--
MW-108	06/26/18	9:59	12.40	6.44	--	NP	5.96	--
MW-108	09/21/18	8:33	12.40	6.12	--	NP	6.28	--
MW-108	11/26/18	13:14	12.40	5.35	--	NP	7.05	--
MW-109	10/20/08	16:15	13.53	6.98	--	NP	6.55	--

**Table 3-3**  
**Groundwater Elevation Data**  
**Former Unocal Edmonds Bulk Fuel Terminal**  
**11720 Unoco Road**  
**Edmonds, Washington**

Monitoring Well	Date	Time	Top of Casing Elevation (feet)	Depth to Water (top of casing) (feet)	Depth to LNAPL (feet)	LNAPL Thickness (feet)	Groundwater Elevation (feet amsl)	Comment
MW-109	12/08/08	11:02	13.53	7.38	--	NP	6.15	--
MW-109	02/20/09	10:00	13.53	7.36	--	NP	6.17	--
MW-109	04/20/09	9:53	13.53	7.30	--	NP	6.23	--
MW-109	06/22/09	11:41	13.53	7.15	--	NP	6.38	--
MW-109	08/03/09	11:22	13.53	7.56	--	NP	5.97	--
MW-109	08/17/09	9:32	13.53	7.60	--	NP	5.93	--
MW-109	10/29/09	9:41	13.53	7.39	--	NP	6.14	--
MW-109	01/18/10	13:51	13.53	6.46	--	NP	7.07	--
MW-109	04/19/10	15:20	13.53	6.87	--	NP	6.66	--
MW-109	07/19/10	7:33	13.53	7.40	--	NP	6.13	--
MW-109	10/25/10	13:58	13.53	6.40	--	NP	7.13	--
MW-109	03/21/11	12:32	13.53	6.74	--	NP	6.79	--
MW-109	06/14/11	10:44	13.53	6.95	--	NP	6.58	--
MW-109	09/26/11	9:49	13.53	7.15	--	NP	6.38	--
MW-109	12/12/11	12:50	13.53	2.33	--	NP	11.20	--
MW-109	03/27/12	14:14	13.53	6.76	--	NP	6.77	--
MW-109	06/27/12	17:22	13.53	7.12	--	NP	6.41	--
MW-109	09/25/12	7:45	13.53	7.51	--	NP	6.02	--
MW-109	12/13/12	10:02	13.53	6.68	--	NP	6.85	--
MW-109	03/25/13	11:34	13.53	6.91	--	NP	6.62	--
MW-109	06/24/13	12:55	13.53	6.64	--	NP	6.89	--
MW-109	09/23/13	13:58	13.53	6.77	--	NP	6.76	--
MW-109	12/16/13	11:40	13.53	7.57	--	NP	5.96	--
MW-109	03/26/14	8:20	13.53	6.26	--	NP	7.27	--
MW-109	06/16/14	13:03	13.53	6.78	--	NP	6.75	--
MW-109	09/29/14	14:46	13.53	6.85	--	NP	6.68	--
MW-109	12/08/14	12:22	13.53	7.01	--	NP	6.52	--
MW-109	03/23/15	15:00	13.53	6.97	--	NP	6.56	--
MW-109	06/22/15	15:54	13.53	7.54	--	NP	5.99	--
MW-109	10/27/16	10:20	13.53	6.80	--	NP	6.73	--
MW-109	07/24/17	--	--	--	--	--	--	Unable to access
MW-109	03/19/18	13:40	13.53	6.68	--	NP	6.85	--
MW-109	06/26/18	9:54	13.53	7.50	--	NP	6.03	--
MW-109	09/21/18	8:35	13.53	7.13	--	NP	6.40	--
MW-109	11/26/18	13:18	13.53	6.20	--	NP	7.33	--
MW-122	10/20/08	16:32	15.54	8.05	--	NP	7.49	--
MW-122	12/08/08	11:40	15.54	7.87	--	NP	7.67	--
MW-122	02/20/09	10:27	15.54	7.85	--	NP	7.69	--
MW-122	04/20/09	10:13	15.54	7.92	--	NP	7.62	--
MW-122	06/22/09	11:54	15.54	8.21	--	NP	7.33	--
MW-122	08/03/09	10:30	15.54	8.31	--	NP	7.23	--
MW-122	08/17/09	9:42	15.54	8.41	--	NP	7.13	--
MW-122	10/29/09	9:35	15.54	7.78	--	NP	7.76	--
MW-122	01/18/10	14:10	15.54	7.35	--	NP	8.19	--
MW-122	04/19/10	15:43	15.54	7.61	--	NP	7.93	--
MW-122	07/19/10	7:49	15.54	8.00	--	NP	7.54	--
MW-122	10/25/10	14:15	15.54	7.52	--	NP	8.02	--
MW-122	03/21/11	12:46	15.54	7.23	--	NP	8.31	--
MW-122	06/14/11	11:11	15.54	7.90	--	NP	7.64	--
MW-122	09/26/11	11:17	15.54	8.10	--	NP	7.44	--
MW-122	12/12/11	12:44	15.54	7.76	--	NP	7.78	--
MW-122	03/27/12	14:30	15.54	7.31	--	NP	8.23	--
MW-122	06/27/12	17:37	15.54	7.59	--	NP	7.95	--
MW-122	09/25/12	8:08	15.54	8.02	--	NP	7.52	--
MW-122	12/13/12	10:29	15.54	7.15	--	NP	8.39	--
MW-122	03/25/13	10:41	15.54	7.39	--	NP	8.15	--
MW-122	06/24/13	12:08	15.54	7.67	--	NP	7.87	--
MW-122	09/23/13	14:05	15.54	7.74	--	NP	7.80	--
MW-122	12/16/13	10:43	15.54	7.71	--	NP	7.83	--
MW-122	03/26/14	8:33	15.54	7.29	--	NP	8.25	--
MW-122	06/16/14	14:02	15.54	7.77	--	NP	7.77	--
MW-122	09/29/14	14:01	15.54	7.66	--	NP	7.88	--
MW-122	12/08/14	13:15	15.54	7.27	--	NP	8.27	--
MW-122	03/23/15	14:36	15.54	7.53	--	NP	8.01	--
MW-122	06/22/15	15:15	15.54	7.92	--	NP	7.62	--
MW-122	10/27/16	10:00	15.54	7.23	--	NP	8.31	--
MW-122	07/24/17	--	--	--	--	--	--	Deep well - not part of the monitoring network
MW-126	10/20/08	17:05	12.40	4.51	--	NP	7.89	--
MW-126	12/08/08	10:00	12.40	4.17	--	NP	8.23	--
MW-126	02/20/09	9:33	12.40	4.32	--	NP	8.08	--
MW-126	04/20/09	8:59	12.40	4.13	--	NP	8.27	--
MW-126	06/22/09	11:03	12.40	4.54	--	NP	7.86	--
MW-126	08/03/09	10:58	12.40	4.85	--	NP	7.55	--

**Table 3-3**  
**Groundwater Elevation Data**  
**Former Unocal Edmonds Bulk Fuel Terminal**  
**11720 Unoco Road**  
**Edmonds, Washington**

Monitoring Well	Date	Time	Top of Casing Elevation (feet)	Depth to Water (top of casing) (feet)	Depth to LNAPL (feet)	LNAPL Thickness (feet)	Groundwater Elevation (feet amsl)	Comment
MW-126	08/17/09	8:44	12.40	4.65	--	NP	7.75	--
MW-126	10/29/09	9:47	12.40	4.00	--	NP	8.40	--
MW-126	01/18/10	13:02	12.40	3.55	--	NP	8.85	--
MW-126	04/19/10	14:10	12.40	3.97	--	NP	8.43	--
MW-126	07/19/10	6:44	12.40	4.72	--	NP	7.68	--
MW-126	10/25/10	13:13	12.40	4.35	--	NP	8.05	--
MW-126	03/21/11	12:08	12.40	3.74	--	NP	8.66	--
MW-126	06/14/11	11:30	12.40	4.49	--	NP	7.91	--
MW-126	09/26/11	10:35	12.40	4.91	--	NP	7.49	--
MW-126	12/12/11	11:51	12.40	4.20	--	NP	8.20	--
MW-126	03/27/12	13:34	12.40	3.85	--	NP	8.55	--
MW-126	06/27/12	16:46	12.40	4.35	--	NP	8.05	--
MW-126	09/25/12	7:21	12.40	4.80	--	NP	7.60	--
MW-126	12/13/12	9:56	12.40	3.68	--	NP	8.72	--
MW-126	03/25/13	11:26	12.40	4.07	--	NP	8.33	--
MW-126	06/24/13	11:11	12.40	4.47	--	NP	7.93	--
MW-126	09/23/13	13:27	12.40	4.57	--	NP	7.83	--
MW-126	12/16/13	9:53	12.40	4.53	--	NP	7.87	--
MW-126	03/26/14	8:04	12.40	3.80	--	NP	8.60	--
MW-126	06/16/14	13:22	12.40	4.39	--	NP	8.01	--
MW-126	09/29/14	14:52	12.40	4.53	--	NP	7.87	--
MW-126	12/08/14	13:18	12.40	3.73	--	NP	8.67	--
MW-126	03/22/15	12:21	12.40	2.84	--	NP	9.56	--
MW-126	06/22/15	15:21	12.40	4.99	--	NP	7.41	--
MW-126	10/27/16	8:58	12.40	3.94	--	NP	8.46	--
MW-126	07/24/17	11:43	12.40	5.95	--	NP	6.45	--
MW-126	03/19/18	12:24	12.40	4.70	--	NP	7.70	--
MW-126	06/26/18	10:03	12.40	4.48	--	NP	7.92	--
MW-126	09/21/18	8:50	12.40	5.74	--	NP	6.66	--
MW-126	11/26/18	12:45	12.40	4.90	--	NP	7.50	--
MW-129R	10/20/08	16:33	12.92	6.54	--	NP	6.38	--
MW-129R	12/08/08	11:38	12.92	6.78	--	NP	6.14	--
MW-129R	02/20/09	10:30	12.92	6.35	6.34	0.01	6.58	See **
MW-129R	04/20/09	10:15	12.92	6.35	--	NP	6.57	--
MW-129R	06/22/09	11:56	12.92	6.71	--	NP	6.21	--
MW-129R	08/03/09	10:25	12.92	6.90	--	NP	6.02	--
MW-129R	08/17/09	9:44	12.92	6.98	--	<0.01	5.94	Film observed during gauging, sheen observed on purge water
MW-129R	10/29/09	9:34	12.92	6.27	--	NP	6.65	--
MW-129R	01/18/10	14:08	12.92	6.22	--	NP	6.70	--
MW-129R	04/19/10	15:44	12.92	5.88	--	NP	7.04	--
MW-129R	07/19/10	7:45	12.92	6.30	--	NP	6.62	--
MW-129R	10/25/10	14:17	12.92	5.79	--	NP	7.13	--
MW-129R	03/21/11	12:49	12.92	5.31	--	NP	7.61	--
MW-129R	06/14/11	11:07	12.92	6.36	--	NP	6.56	--
MW-129R	09/26/11	11:10	12.92	6.66	--	<0.01	6.26	Film observed during gauging, confirmed with bailer
MW-129R	12/12/11	13:53	12.92	6.31	--	NP	6.61	--
MW-129R	03/27/12	14:37	12.92	5.37	--	NP	7.55	--
MW-129R	06/27/12	17:35	12.92	5.81	--	NP	7.11	--
MW-129R	09/25/12	8:05	12.92	6.44	--	NP	6.48	--
MW-129R	12/13/12	10:20	12.92	5.52	--	NP	7.40	--
MW-129R	03/25/13	10:40	12.92	5.20	--	NP	7.72	--
MW-129R	06/24/13	12:52	12.92	5.71	--	NP	7.21	--
MW-129R	09/23/13	14:42	12.92	6.31	--	NP	6.61	--
MW-129R	12/16/13	10:45	12.92	6.96	--	NP	5.96	--
MW-129R	03/23/14	14:36	12.92	5.90	--	NP	7.02	Sheen observed on purge water
MW-129R	03/26/14	8:31	12.92	5.53	--	NP	7.39	--
MW-129R	06/16/14	13:56	12.92	5.95	--	NP	6.97	--
MW-129R	09/29/14	14:47	12.92	6.18	--	NP	6.74	--
MW-129R	12/08/14	12:46	12.92	5.65	--	NP	7.27	--
MW-129R	06/22/15	15:14	12.92	6.13	--	NP	6.79	--
MW-129R	10/27/16	9:59	12.92	5.59	--	NP	7.33	--
MW-129R	07/24/17	12:57	12.92	5.62	--	NP	7.30	Film observed during gauging, confirmed with bailer
MW-129R	03/19/18	12:45	12.92	5.53	--	NP	7.39	--
MW-129R	06/26/18	10:23	12.92	5.95	--	NP	6.97	--
MW-129R	09/21/18	8:15	12.92	6.00	--	NP	6.92	--
MW-129R	11/26/18	12:29	12.92	5.43	--	NP	7.49	PID: 42.1
MW-129R	02/07/19	10:21	12.92	5.64	--	NP	7.28	Not part of the quarterly monitoring program; gauged out of low tide window
MW-13U	10/20/08	16:46	25.60	17.52	--	NP	8.08	--
MW-13U	12/08/08	12:03	25.60	17.32	--	NP	8.28	--
MW-13U	02/20/09	10:52	25.60	17.29	--	NP	8.31	--
MW-13U	04/20/09	10:35	25.60	17.10	--	NP	8.50	--
MW-13U	06/22/09	11:40	25.60	17.40	--	NP	8.20	--
MW-13U	08/03/09	10:39	25.60	17.53	--	NP	8.07	--

**Table 3-3**  
**Groundwater Elevation Data**  
**Former Unocal Edmonds Bulk Fuel Terminal**  
**11720 Unoco Road**  
**Edmonds, Washington**

Monitoring Well	Date	Time	Top of Casing Elevation (feet)	Depth to Water (top of casing) (feet)	Depth to LNAPL (feet)	LNAPL Thickness (feet)	Groundwater Elevation (feet amsl)	Comment
MW-13U	08/17/09	9:55	25.60	17.63	--	NP	7.97	--
MW-13U	10/29/09	9:32	25.60	17.26	--	NP	8.34	--
MW-13U	01/18/10	14:02	25.60	16.21	--	NP	9.39	--
MW-13U	04/19/10	16:06	25.60	16.52	--	NP	9.08	--
MW-13U	07/19/10	8:10	25.60	17.21	--	NP	8.39	--
MW-13U	10/25/10	14:48	25.60	17.25	--	NP	8.35	--
MW-13U	03/21/11	13:03	25.60	16.33	--	NP	9.27	--
MW-13U	06/14/11	11:30	25.60	16.88	--	NP	8.72	--
MW-13U	09/26/11	11:15	25.60	17.34	--	NP	8.26	--
MW-13U	12/12/11	13:24	25.60	16.96	--	NP	8.64	--
MW-13U	03/27/12	14:53	25.60	16.49	--	NP	9.11	--
MW-13U	06/27/12	17:44	25.60	16.92	--	NP	8.68	--
MW-13U	09/25/12	8:28	25.60	17.41	--	NP	8.19	--
MW-13U	12/13/12	10:39	25.60	16.56	--	NP	9.04	--
MW-13U	03/25/13	11:03	25.60	16.78	--	NP	8.82	--
MW-13U	06/24/13	12:37	25.60	17.11	--	NP	8.49	--
MW-13U	09/23/13	13:32	25.60	17.23	--	NP	8.37	--
MW-13U	12/16/13	11:05	25.60	17.30	--	NP	8.30	--
MW-13U	03/26/14	8:28	25.60	16.44	--	NP	9.16	--
MW-13U	06/16/14	14:10	25.60	17.02	--	NP	8.58	--
MW-13U	09/29/14	14:53	25.60	17.22	--	NP	8.38	--
MW-13U	12/08/14	13:09	25.60	16.58	--	NP	9.02	--
MW-13U	03/23/15	14:32	25.60	16.61	--	NP	8.99	--
MW-13U	06/22/15	15:46	25.60	17.13	--	NP	8.47	--
MW-13U	10/27/16	9:40	25.60	16.91	--	NP	8.69	--
MW-13U	07/24/17	12:15	25.60	17.03	--	NP	8.57	--
MW-13U	03/19/18	12:44	25.60	17.03	--	NP	8.57	--
MW-13U	06/26/18	11:20	25.60	17.57	--	NP	8.03	--
MW-13U	09/21/18	9:42	25.60	17.49	--	NP	8.11	--
MW-13U	11/26/18	12:51	25.60	17.30	--	NP	8.30	--
MW-131	10/20/08	16:17	12.53	6.37	--	NP	6.16	--
MW-131	12/08/08	11:31	12.53	6.10	--	NP	6.43	--
MW-131	02/20/09	10:58	12.53	5.91	--	NP	6.62	--
MW-131	04/20/09	8:42	12.53	5.75	--	NP	6.78	--
MW-131	06/22/09	11:46	12.53	6.27	--	NP	6.26	--
MW-131	08/03/09	11:31	12.53	6.45	--	NP	6.08	--
MW-131	08/17/09	9:32	12.53	6.46	--	NP	6.07	--
MW-131	10/29/09	9:30	12.53	5.70	--	NP	6.83	--
MW-131	01/18/10	13:46	12.53	4.81	--	NP	7.72	--
MW-131	04/19/10	15:32	12.53	5.49	--	NP	7.04	--
MW-131	07/19/10	8:36	12.53	6.11	--	NP	6.42	--
MW-131	10/25/10	14:12	12.53	5.83	--	NP	6.70	--
MW-131	03/21/11	12:42	12.53	4.83	--	NP	7.70	--
MW-131	06/14/11	10:53	12.53	5.95	--	NP	6.58	--
MW-131	09/26/11	11:04	12.53	6.40	--	NP	6.13	--
MW-131	12/12/11	12:11	12.53	5.84	--	NP	6.69	--
MW-131	03/27/12	14:20	12.53	5.24	--	NP	7.29	--
MW-131	06/27/12	17:28	12.53	5.68	--	NP	6.85	--
MW-131	09/25/12	8:00	12.53	6.34	--	NP	6.19	--
MW-131	12/13/12	10:54	12.53	5.19	--	NP	7.34	--
MW-131	03/25/13	10:45	12.53	5.12	--	NP	7.41	--
MW-131	06/24/13	12:05	12.53	5.92	--	NP	6.61	--
MW-131	09/23/13	14:02	12.53	6.05	--	NP	6.48	--
MW-131	12/16/13	10:32	12.53	6.04	--	NP	6.49	--
MW-131	03/26/14	9:11	12.53	5.51	--	NP	7.02	--
MW-131	06/16/14	13:52	12.53	5.95	--	NP	6.58	--
MW-131	09/29/14	13:57	12.53	5.93	--	NP	6.60	--
MW-131	12/08/14	12:50	12.53	5.36	--	NP	7.17	--
MW-131	03/23/15	14:03	12.53	5.38	--	NP	7.15	--
MW-131	06/22/15	15:19	12.53	6.15	--	NP	6.38	--
MW-131	10/27/16	9:50	12.53	4.98	--	NP	7.55	--
MW-131	07/24/17	--	--	--	--	--	--	Not part of the monitoring network
MW-131	03/19/18	--	--	--	--	--	--	Not part of the monitoring network
MW-131	06/26/18	10:30	12.53	6.22	--	NP	6.31	Not part of the monitoring network
MW-131	09/21/18	--	12.53	--	--	--	--	Not part of the monitoring network
MW-134X	10/20/08	16:40	35.13	26.58	--	NP	8.55	--
MW-134X	12/08/08	11:57	35.13	26.55	--	NP	8.58	--
MW-134X	02/20/09	10:55	35.13	26.62	--	NP	8.51	--
MW-134X	04/20/09	10:30	35.13	26.43	--	NP	8.70	--
MW-134X	06/22/09	11:35	35.13	26.69	--	NP	8.44	--
MW-134X	08/03/09	10:36	35.13	26.70	--	NP	8.43	--
MW-134X	08/17/09	9:50	35.13	26.79	--	NP	8.34	--
MW-134X	10/29/09	9:25	35.13	26.34	--	NP	8.79	--



**Table 3-3**  
**Groundwater Elevation Data**  
**Former Unocal Edmonds Bulk Fuel Terminal**  
**11720 Unoco Road**  
**Edmonds, Washington**

Monitoring Well	Date	Time	Top of Casing Elevation (feet)	Depth to Water (top of casing) (feet)	Depth to LNAPL (feet)	LNAPL Thickness (feet)	Groundwater Elevation (feet amsl)	Comment
MW-134X	01/18/10	13:57	35.13	25.51	--	NP	9.62	--
MW-134X	04/19/10	16:01	35.13	25.64	--	NP	9.49	--
MW-134X	07/19/10	8:06	35.13	26.41	--	NP	8.72	--
MW-134X	10/25/10	14:43	35.13	26.40	--	NP	8.73	--
MW-134X	03/21/11	13:00	35.13	25.65	--	NP	9.48	--
MW-134X	06/14/11	11:22	35.13	26.20	--	NP	8.93	--
MW-134X	09/26/11	11:11	35.13	26.34	--	NP	8.79	--
MW-134X	12/12/11	13:16	35.13	26.21	--	NP	8.92	--
MW-134X	03/27/12	14:48	35.13	25.75	--	NP	9.38	--
MW-134X	06/27/12	17:54	35.13	26.15	--	NP	8.98	--
MW-134X	09/25/12	8:25	35.13	26.50	--	NP	8.63	--
MW-134X	12/13/12	11:00	35.13	25.97	--	NP	9.16	--
MW-134X	03/25/13	11:11	35.13	25.97	--	NP	9.16	--
MW-134X	06/24/13	12:34	35.13	26.14	--	NP	8.99	--
MW-134X	09/23/13	13:43	35.13	26.52	--	NP	8.61	--
MW-134X	12/16/13	11:10	35.13	26.53	--	NP	8.60	--
MW-134X	03/26/14	9:15	35.13	25.61	--	NP	9.52	--
MW-134X	06/16/14	14:02	35.13	26.15	--	NP	8.98	--
MW-134X	09/29/14	15:15	35.13	26.26	--	NP	8.87	--
MW-134X	12/08/14	13:04	35.13	25.89	--	NP	9.24	--
MW-134X	03/23/15	11:53	35.13	25.83	--	NP	9.30	--
MW-134X	06/22/15	15:44	35.13	26.26	--	NP	8.87	--
MW-134X	10/27/16	9:30	35.13	24.16	--	NP	10.97	--
MW-134X	07/24/17	12:31	35.13	26.02	--	NP	9.11	--
MW-134X	03/19/18	12:51	35.13	26.10	--	NP	9.03	--
MW-134X	06/26/18	10:35	35.13	26.41	--	NP	8.72	--
MW-134X	09/21/18	8:56	35.13	26.40	--	NP	8.73	--
MW-134X	11/26/18	12:45	35.13	26.19	--	NP	8.94	--
MW-135	10/20/08	16:35	18.13	10.06	--	NP	8.07	--
MW-135	12/08/08	11:47	18.13	11.43	--	NP	6.70	--
MW-135	02/20/09	10:47	18.13	10.14	--	NP	7.99	--
MW-135	04/20/09	10:22	18.13	11.17	--	NP	6.96	--
MW-135	06/22/09	11:23	18.13	10.84	--	NP	7.29	--
MW-135	08/03/09	10:13	18.13	11.04	--	NP	7.09	--
MW-135	08/17/09	9:55	18.13	11.16	--	NP	6.97	--
MW-135	10/29/09	10:15	18.13	11.00	--	NP	7.13	--
MW-135	01/18/10	13:05	18.13	10.20	--	NP	7.93	--
MW-135	04/19/10	15:54	18.13	10.78	--	NP	7.35	--
MW-135	07/19/10	7:52	18.13	10.97	--	NP	7.16	--
MW-135	10/25/10	14:26	18.13	10.75	--	NP	7.38	--
MW-135	03/21/11	12:56	18.13	10.53	--	NP	7.60	--
MW-135	06/14/11	11:26	18.13	10.05	--	NP	8.08	--
MW-135	09/26/11	11:05	18.13	11.25	--	NP	6.88	--
MW-135	12/12/11	13:08	18.13	11.01	--	NP	7.12	--
MW-135	03/27/12	14:41	18.13	10.61	--	NP	7.52	--
MW-135	06/27/12	17:43	18.13	10.41	--	NP	7.72	--
MW-135	09/25/12	8:15	18.13	11.19	--	NP	6.94	--
MW-135	12/13/12	10:32	18.13	10.48	--	NP	7.65	--
MW-135	03/25/13	10:40	18.13	10.46	--	NP	7.67	--
MW-135	06/24/13	12:27	18.13	10.62	--	NP	7.51	--
MW-135	09/23/13	13:56	18.13	11.00	--	NP	7.13	--
MW-135	12/16/13	10:38	18.13	11.56	--	NP	6.57	--
MW-135	03/26/14	--	18.13	--	--	--	--	--
MW-135	06/16/14	13:20	18.13	10.78	--	NP	7.35	--
MW-135	09/29/14	14:35	18.13	10.99	--	NP	7.14	--
MW-135	12/08/14	13:17	18.13	10.77	--	NP	7.36	--
MW-135	03/23/15	14:50	18.13	10.35	--	NP	7.78	--
MW-135	06/22/15	14:41	18.13	11.10	--	NP	7.03	--
MW-135	10/27/16	9:40	18.13	10.69	--	NP	7.44	--
MW-135	07/24/17	11:50	18.13	10.88	--	NP	7.25	--
MW-135	03/19/18	12:34	18.13	10.51	--	NP	7.62	--
MW-135	06/26/18	9:57	18.13	11.59	--	NP	6.54	--
MW-135	09/21/18	9:18	18.13	11.21	--	NP	6.92	--
MW-135	11/26/18	12:39	18.13	11.09	--	NP	7.04	--
MW-136	10/27/08	13:35	15.99	8.13	--	NP	7.86	--
MW-136	12/08/08	11:49	15.99	8.06	--	NP	7.93	--
MW-136	02/20/09	10:50	15.99	7.80	--	NP	8.19	--
MW-136	04/20/09	10:25	15.99	7.73	--	NP	8.26	--
MW-136	06/22/09	11:25	15.99	8.00	--	NP	7.99	--
MW-136	08/03/09	10:14	15.99	8.74	--	NP	7.25	--
MW-136	08/17/09	9:57	15.99	9.78	--	NP	6.21	--
MW-136	10/29/09	10:20	15.99	7.84	--	NP	8.15	--
MW-136	01/18/10	13:02	15.99	7.08	--	NP	8.91	--

**Table 3-3**  
**Groundwater Elevation Data**  
**Former Unocal Edmonds Bulk Fuel Terminal**  
**11720 Unoco Road**  
**Edmonds, Washington**

Monitoring Well	Date	Time	Top of Casing Elevation (feet)	Depth to Water (top of casing) (feet)	Depth to LNAPL (feet)	LNAPL Thickness (feet)	Groundwater Elevation (feet amsl)	Comment
MW-136	04/19/10	15:55	15.99	7.63	--	NP	8.36	--
MW-136	07/19/10	7:55	15.99	8.06	--	NP	7.93	--
MW-136	10/25/10	14:23	15.99	7.91	--	NP	8.08	--
MW-136	03/21/11	12:56	15.99	6.22	--	NP	9.77	--
MW-136	06/14/11	11:23	15.99	7.77	--	NP	8.22	--
MW-136	09/26/11	11:23	15.99	8.70	--	NP	7.29	--
MW-136	12/12/11	13:10	15.99	7.69	--	NP	8.30	--
MW-136	03/27/12	14:43	15.99	7.44	--	NP	8.55	--
MW-136	06/27/12	17:45	15.99	7.79	--	NP	8.20	--
MW-136	09/25/12	8:05	15.99	8.31	--	NP	7.68	--
MW-136	12/13/12	10:25	15.99	6.78	--	NP	9.21	--
MW-136	03/25/13	10:35	15.99	7.46	--	NP	8.53	--
MW-136	06/24/13	12:28	15.99	7.86	--	NP	8.13	--
MW-136	09/23/13	13:55	15.99	8.01	--	NP	7.98	--
MW-136	12/16/13	10:50	15.99	7.80	--	NP	8.19	--
MW-136	03/26/14	9:02	15.99	6.85	--	NP	9.14	--
MW-136	06/16/14	13:32	15.99	7.80	--	NP	8.19	--
MW-136	09/29/14	15:20	15.99	7.72	--	NP	8.27	--
MW-136	12/08/14	13:15	15.99	7.11	--	NP	8.88	--
MW-136	03/23/15	14:25	15.99	7.04	--	NP	8.95	--
MW-136	06/22/15	14:43	15.99	7.86	--	NP	8.13	--
MW-136	10/27/16	9:32	15.99	7.40	--	NP	8.59	--
MW-136	07/24/17	11:52	15.99	8.12	--	NP	7.87	--
MW-136	03/19/18	12:49	15.99	7.88	--	NP	8.11	--
MW-136	06/26/18	11:28	15.99	8.32	--	NP	7.67	--
MW-136	09/21/18	9:17	15.99	8.25	--	NP	7.74	--
MW-136	11/26/18	12:38	15.99	8.03	--	NP	7.96	--
MW-139R	10/20/08	15:59	13.84	7.57	--	NP	6.27	--
MW-139R	12/08/08	10:46	13.84	7.17	--	NP	6.67	--
MW-139R	02/20/09	9:48	13.84	6.96	--	NP	6.88	--
MW-139R	04/20/09	9:38	13.84	6.77	--	NP	7.07	--
MW-139R	06/22/09	11:27	13.84	7.34	--	NP	6.50	--
MW-139R	08/03/09	11:12	13.84	7.54	--	NP	6.30	--
MW-139R	08/17/09	9:21	13.84	7.62	--	NP	6.22	--
MW-139R	10/29/09	9:23	13.84	6.93	--	NP	6.91	--
MW-139R	01/18/10	13:45	13.84	5.43	--	NP	8.41	--
MW-139R	04/19/10	14:58	13.84	6.51	--	NP	7.33	--
MW-139R	07/19/10	7:15	13.84	7.36	--	NP	6.48	--
MW-139R	10/25/10	13:48	13.84	7.08	--	NP	6.76	--
MW-139R	03/21/11	12:27	13.84	5.89	--	NP	7.95	--
MW-139R	06/14/11	10:39	13.84	7.01	--	NP	6.83	--
MW-139R	09/26/11	10:53	13.84	7.62	--	NP	6.22	--
MW-139R	12/12/11	12:07	13.84	6.95	--	NP	6.89	--
MW-139R	03/27/12	13:59	13.84	6.35	--	NP	7.49	--
MW-139R	06/27/12	17:05	13.84	6.92	--	NP	6.92	--
MW-139R	09/25/12	7:38	13.84	7.62	--	NP	6.22	--
MW-139R	12/13/12	10:12	13.84	6.33	--	NP	7.51	--
MW-139R	03/25/13	10:14	13.84	6.75	--	NP	7.09	--
MW-139R	06/24/13	11:32	13.84	7.31	--	NP	6.53	--
MW-139R	09/23/13	13:44	13.84	7.20	--	NP	6.64	--
MW-139R	12/16/13	11:23	13.84	7.38	--	NP	6.46	--
MW-139R	03/26/14	8:22	13.84	6.50	--	NP	7.34	--
MW-139R	06/16/14	13:34	13.84	7.23	--	NP	6.61	--
MW-139R	09/29/14	13:44	13.84	7.15	--	NP	6.69	--
MW-139R	12/08/14	12:36	13.84	6.50	--	NP	7.34	--
MW-139R	03/23/15	13:49	13.84	6.56	--	NP	7.28	--
MW-139R	06/22/15	15:26	13.84	7.35	--	NP	6.49	--
MW-139R	10/27/16	9:18	13.84	6.04	--	NP	7.80	--
MW-139R	07/24/17	11:50	13.84	7.42	--	NP	6.42	--
MW-139R	03/19/18	12:33	13.84	7.01	--	NP	6.83	--
MW-139R	06/26/18	10:17	13.84	7.63	--	NP	6.21	--
MW-139R	09/21/18	9:13	13.84	7.40	--	NP	6.44	--
MW-139R	11/26/18	13:05	13.84	7.16	--	NP	6.68	--
MW-143	10/22/08	12:25	11.94	4.55	--	NP	7.39	--
MW-143	12/16/08	10:16	11.94	4.08	--	NP	7.86	--
MW-143	02/20/09	10:18	11.94	4.02	--	NP	7.92	--
MW-143	04/20/09	9:31	11.94	3.79	--	NP	8.15	--
MW-143	06/22/09	11:05	11.94	4.45	--	NP	7.49	--
MW-143	08/03/09	10:57	11.94	4.70	--	NP	7.24	--
MW-143	08/17/09	8:45	11.94	4.69	--	NP	7.25	--
MW-143	10/29/09	9:50	11.94	4.07	--	NP	7.87	--
MW-143	01/18/10	13:07	11.94	2.81	--	NP	9.13	--
MW-143	04/19/10	14:12	11.94	3.46	--	NP	8.48	--

**Table 3-3**  
**Groundwater Elevation Data**  
**Former Unocal Edmonds Bulk Fuel Terminal**  
**11720 Unoco Road**  
**Edmonds, Washington**

Monitoring Well	Date	Time	Top of Casing Elevation (feet)	Depth to Water (top of casing) (feet)	Depth to LNAPL (feet)	LNAPL Thickness (feet)	Groundwater Elevation (feet amsl)	Comment
MW-143	07/19/10	6:44	11.94	4.47	--	NP	7.47	--
MW-143	10/25/10	13:18	11.94	3.17	--	NP	8.77	--
MW-143	03/21/11	12:06	11.94	3.80	--	NP	8.14	--
MW-143	06/14/11	11:31	11.94	4.14	--	NP	7.80	--
MW-143	09/26/11	10:36	11.94	2.90	--	NP	9.04	--
MW-143	12/12/11	11:50	11.94	3.84	--	NP	8.10	--
MW-143	03/27/12	13:36	11.94	3.83	--	NP	8.11	--
MW-143	06/27/12	16:44	11.94	4.13	--	NP	7.81	--
MW-143	09/25/12	7:22	11.94	4.76	--	NP	7.18	--
MW-143	12/13/12	9:58	11.94	3.52	--	NP	8.42	--
MW-143	03/25/13	10:14	11.94	3.63	--	NP	8.31	--
MW-143	06/24/13	11:13	11.94	3.65	--	NP	8.29	--
MW-143	09/23/13	13:26	11.94	4.46	--	NP	7.48	--
MW-143	12/16/13	9:50	11.94	4.35	--	NP	7.59	--
MW-143	03/26/14	8:18	11.94	3.66	--	NP	8.28	--
MW-143	06/16/14	14:09	11.94	4.34	--	NP	7.60	--
MW-143	09/29/14	14:53	11.94	4.45	--	NP	7.49	--
MW-143	12/08/14	11:35	11.94	3.70	--	NP	8.24	--
MW-143	03/23/15	13:19	11.94	3.56	--	NP	8.38	--
MW-143	06/22/15	15:19	11.94	4.65	--	NP	7.29	--
MW-143	10/27/16	10:00	11.94	4.83	--	NP	7.11	--
MW-143	07/24/17	11:41	11.94	5.65	--	NP	6.29	--
MW-143	03/19/18	12:23	11.94	4.53	--	NP	7.41	--
MW-143	06/26/18	10:00	11.94	4.57	--	NP	7.37	--
MW-143	09/21/18	8:48	11.94	5.76	--	NP	6.18	--
MW-143	11/26/18	12:44	11.94	5.04	--	NP	6.90	PID: 13.6
MW-147	10/20/08	15:45	11.02	5.69	--	NP	5.33	--
MW-147	12/08/08	10:13	11.02	5.51	--	NP	5.51	--
MW-147	02/20/09	9:13	11.02	5.35	--	NP	5.67	--
MW-147	04/20/09	9:13	11.02	5.76	--	NP	5.26	--
MW-147	06/22/09	11:08	11.02	5.67	--	NP	5.35	--
MW-147	08/03/09	10:50	11.02	5.72	--	NP	5.30	--
MW-147	08/17/09	8:51	11.02	5.99	--	NP	5.03	--
MW-147	10/29/09	8:48	11.02	5.01	--	NP	6.01	--
MW-147	01/18/10	13:18	11.02	2.86	--	NP	8.16	--
MW-147	04/19/10	14:25	11.02	5.12	--	NP	5.90	--
MW-147	07/19/10	6:58	11.02	5.93	--	NP	5.09	--
MW-147	10/25/10	13:28	11.02	4.74	--	NP	6.28	--
MW-147	03/21/11	12:15	11.02	4.07	--	NP	6.95	--
MW-147	06/14/11	9:56	11.02	5.70	--	NP	5.32	--
MW-147	09/26/11	10:39	11.02	8.78	--	NP	2.24	--
MW-147	12/12/11	11:34	11.02	5.58	--	NP	5.44	--
MW-147	03/27/12	13:43	11.02	4.70	--	NP	6.32	--
MW-147	06/27/12	16:35	11.02	5.37	--	NP	5.65	--
MW-147	09/25/12	7:25	11.02	5.98	--	NP	5.04	--
MW-147	12/13/12	9:46	11.02	4.26	--	NP	6.76	--
MW-147	03/25/13	9:56	11.02	5.57	--	NP	5.45	--
MW-147	06/24/13	11:16	11.02	5.64	--	NP	5.38	--
MW-147	09/23/13	13:23	11.02	5.33	--	NP	5.69	--
MW-147	12/16/13	9:46	11.02	5.80	--	NP	5.22	--
MW-147	03/26/14	7:42	11.02	4.96	--	NP	6.06	--
MW-147	06/16/14	13:12	11.02	5.70	--	NP	5.32	--
MW-147	09/29/14	13:23	11.02	5.16	--	NP	5.86	--
MW-147	12/08/14	11:30	11.02	4.41	--	NP	6.61	--
MW-147	03/23/15	13:04	11.02	4.95	--	NP	6.07	--
MW-147	06/22/15	15:12	11.02	5.86	--	NP	5.16	--
MW-147	10/27/16	8:52	11.02	3.95	--	NP	7.07	--
MW-147	07/24/17	11:28	11.02	5.78	--	NP	5.24	--
MW-147	03/19/18	12:11	11.02	5.31	--	NP	5.71	--
MW-147	06/26/18	9:50	11.02	5.96	--	NP	5.06	--
MW-147	09/21/18	8:31	11.02	5.84	--	NP	5.18	--
MW-147	11/26/18	12:33	11.02	4.88	--	NP	6.14	--
MW-149R	10/20/08	15:42	12.18	6.76	--	NP	5.42	--
MW-149R	12/08/08	10:07	12.18	6.70	--	NP	5.48	--
MW-149R	02/20/09	9:10	12.18	6.57	--	NP	5.61	--
MW-149R	04/20/09	9:06	12.18	7.09	--	NP	5.09	--
MW-149R	06/22/09	11:10	12.18	7.22	--	NP	4.96	--
MW-149R	08/03/09	10:46	12.18	7.33	--	NP	4.85	--
MW-149R	08/17/09	8:48	12.18	7.69	--	NP	4.49	--
MW-149R	10/29/09	8:50	12.18	6.77	--	NP	5.41	--
MW-149R	01/18/10	13:15	12.18	3.90	--	NP	8.28	--
MW-149R	04/19/10	14:20	12.18	6.76	--	NP	5.42	--
MW-149R	07/19/10	6:50	12.18	7.56	--	NP	4.62	--

**Table 3-3**  
**Groundwater Elevation Data**  
**Former Unocal Edmonds Bulk Fuel Terminal**  
**11720 Unoco Road**  
**Edmonds, Washington**

Monitoring Well	Date	Time	Top of Casing Elevation (feet)	Depth to Water (top of casing) (feet)	Depth to LNAPL (feet)	LNAPL Thickness (feet)	Groundwater Elevation (feet amsl)	Comment
MW-149R	10/25/10	13:23	12.18	6.13	--	NP	6.05	--
MW-149R	03/21/11	12:13	12.18	5.39	--	NP	6.79	--
MW-149R	06/14/11	9:44	12.18	7.27	--	NP	4.91	--
MW-149R	09/26/11	10:44	12.18	7.19	--	NP	4.99	--
MW-149R	12/12/11	11:29	12.18	6.74	--	NP	5.44	--
MW-149R	03/27/12	13:41	12.18	6.07	--	NP	6.11	--
MW-149R	06/27/12	16:30	12.18	6.75	--	NP	5.43	--
MW-149R	09/25/12	7:14	12.18	7.58	--	NP	4.60	--
MW-149R	12/13/12	9:41	12.18	5.34	--	NP	6.84	--
MW-149R	03/25/13	9:49	12.18	6.95	--	NP	5.23	--
MW-149R	06/24/13	11:17	12.18	7.24	--	NP	4.94	--
MW-149R	09/23/13	13:14	12.18	6.60	--	NP	5.58	--
MW-149R	12/16/13	9:33	12.18	6.90	--	NP	5.28	--
MW-149R	03/26/14	7:35	12.18	6.08	--	NP	6.10	--
MW-149R	06/16/14	13:05	12.18	7.28	--	NP	4.90	--
MW-149R	09/29/14	13:17	12.18	6.43	--	NP	5.75	--
MW-149R	12/08/14	11:27	12.18	5.59	--	NP	6.59	--
MW-149R	03/23/15	13:00	12.18	6.21	--	NP	5.97	--
MW-149R	06/22/15	15:01	12.18	7.34	--	NP	4.84	--
MW-149R	10/27/16	8:44	12.18	5.41	--	NP	6.77	--
MW-149R	07/24/17	11:21	12.18	7.28	--	NP	4.90	--
MW-149R	03/19/18	12:09	12.18	6.49	--	NP	5.69	--
MW-149R	06/26/18	9:38	12.18	7.40	--	NP	4.78	--
MW-149R	09/21/18	8:24	12.18	7.34	--	NP	4.84	--
MW-149R	11/26/18	12:26	12.18	5.94	--	NP	6.24	--
MW-150	10/20/08	15:41	12.36	7.21	--	NP	5.15	--
MW-150	12/08/08	10:05	12.36	6.90	--	NP	5.46	--
MW-150	02/20/09	9:07	12.36	6.76	--	NP	5.60	--
MW-150	04/20/09	9:04	12.36	6.89	--	NP	5.47	--
MW-150	06/22/09	11:12	12.36	6.81	--	NP	5.55	--
MW-150	08/03/09	10:44	12.36	6.95	--	NP	5.41	--
MW-150	08/17/09	8:46	12.36	7.15	--	NP	5.21	--
MW-150	10/29/09	8:48	12.36	6.44	--	NP	5.92	--
MW-150	01/18/10	13:14	12.36	4.20	--	NP	8.16	--
MW-150	04/19/10	14:18	12.36	6.34	--	NP	6.02	--
MW-150	07/19/10	6:47	12.36	7.07	--	NP	5.29	--
MW-150	10/25/10	13:25	12.36	6.55	--	NP	5.81	--
MW-150	03/21/11	12:11	12.36	4.93	--	NP	7.43	--
MW-150	06/14/11	9:40	12.36	6.75	--	NP	5.61	--
MW-150	09/26/11	10:43	12.36	7.15	--	NP	5.21	--
MW-150	12/12/11	11:30	12.36	6.89	--	NP	5.47	--
MW-150	03/27/12	13:38	12.36	5.81	--	NP	6.55	--
MW-150	06/27/12	16:28	12.36	6.61	--	NP	5.75	--
MW-150	09/25/12	7:10	12.36	DRY	DRY	DRY	DRY	--
MW-150	12/13/12	9:42	12.36	5.36	--	NP	7.00	--
MW-150	03/25/13	9:46	12.36	6.62	--	NP	5.74	--
MW-150	06/24/13	11:15	12.36	6.98	--	NP	5.38	--
MW-150	09/23/13	13:15	12.36	6.81	--	NP	5.55	--
MW-150	12/16/13	9:30	12.36	7.17	--	NP	5.19	--
MW-150	03/26/14	7:32	12.36	6.09	--	NP	6.27	--
MW-150	06/16/14	13:08	12.36	6.95	--	NP	5.41	--
MW-150	09/29/14	13:15	12.36	6.55	--	NP	5.81	--
MW-150	12/08/14	11:25	12.36	5.90	--	NP	6.46	--
MW-150	03/23/15	12:57	12.36	5.96	--	NP	6.40	--
MW-150	06/22/15	15:07	12.36	6.99	--	NP	5.37	--
MW-150	10/27/16	8:42	12.36	5.28	--	NP	7.08	--
MW-150	07/24/17	11:19	12.36	6.96	--	NP	5.40	--
MW-150	03/19/18	12:09	12.36	6.36	--	NP	6.00	--
MW-150	06/26/18	9:40	12.36	7.02	--	NP	5.34	--
MW-150	09/21/18	8:20	12.36	7.14	--	NP	5.22	--
MW-150	11/26/18	12:24	12.36	6.22	--	NP	6.14	--
MW-151	10/20/08	15:39	11.05	5.76	--	NP	5.29	--
MW-151	12/08/08	10:02	11.05	5.41	--	NP	5.64	--
MW-151	02/20/09	9:16	11.05	5.28	--	NP	5.77	--
MW-151	04/20/09	9:10	11.05	5.24	--	NP	5.81	--
MW-151	06/22/09	11:07	11.05	5.52	--	NP	5.53	--
MW-151	08/03/09	10:48	11.05	5.64	--	NP	5.41	--
MW-151	08/17/09	8:51	11.05	5.82	--	NP	5.23	--
MW-151	10/29/09	8:42	11.05	4.44	--	NP	6.61	--
MW-151	01/18/10	13:10	11.05	1.26	--	NP	9.79	--
MW-151	04/19/10	14:15	11.05	4.77	--	NP	6.28	--
MW-151	07/19/10	6:53	11.05	7.80	--	NP	3.25	--
MW-151	10/25/10	13:21	11.05	4.63	--	NP	6.42	--

**Table 3-3**  
**Groundwater Elevation Data**  
**Former Unocal Edmonds Bulk Fuel Terminal**  
**11720 Unoco Road**  
**Edmonds, Washington**

Monitoring Well	Date	Time	Top of Casing Elevation (feet)	Depth to Water (top of casing) (feet)	Depth to LNAPL (feet)	LNAPL Thickness (feet)	Groundwater Elevation (feet amsl)	Comment
MW-151	03/21/11	12:10	11.05	2.71	--	NP	8.34	--
MW-151	06/14/11	9:51	11.05	7.38	--	NP	3.67	--
MW-151	09/26/11	10:38	11.05	5.75	--	NP	5.30	--
MW-151	12/12/11	11:35	11.05	5.29	--	NP	5.76	--
MW-151	03/27/12	13:39	11.05	3.96	--	NP	7.09	--
MW-151	06/27/12	16:31	11.05	5.01	--	NP	6.04	--
MW-151	09/25/12	7:20	11.05	5.85	--	NP	5.20	--
MW-151	12/13/12	9:45	11.05	3.42	--	NP	7.63	--
MW-151	03/25/13	9:53	11.05	4.98	--	NP	6.07	--
MW-151	06/24/13	11:21	11.05	5.60	--	NP	5.45	--
MW-151	09/23/13	13:20	11.05	5.39	--	NP	5.66	--
MW-151	12/16/13	9:40	11.05	5.79	--	NP	5.26	--
MW-151	03/26/14	7:37	11.05	4.25	--	NP	6.80	--
MW-151	06/16/14	13:12	11.05	5.60	--	NP	5.45	--
MW-151	09/29/14	14:54	11.05	5.19	--	NP	5.86	--
MW-151	12/08/14	11:49	11.05	4.21	--	NP	6.84	--
MW-151	03/23/15	13:10	11.05	4.41	--	NP	6.64	--
MW-151	06/22/15	15:09	11.05	5.73	--	NP	5.32	--
MW-151	10/27/16	8:53	11.05	4.46	--	NP	6.59	--
MW-151	07/24/17	--	--	--	--	--	--	Not part of the monitoring network
MW-151	03/19/18	--	--	--	--	--	--	Not part of the monitoring network
MW-151	06/26/18	9:44	11.05	5.80	--	NP	5.25	Not part of the monitoring network
MW-151	09/21/18	--	11.05	--	--	--	--	Not part of the monitoring network
MW-20R	10/20/08	15:51	12.17	6.53	--	NP	5.64	--
MW-20R	12/08/08	10:27	12.17	6.50	--	NP	5.67	--
MW-20R	02/20/09	9:27	12.17	6.37	--	NP	5.80	--
MW-20R	04/20/09	9:11	12.17	6.80	--	NP	5.37	--
MW-20R	06/22/09	11:21	12.17	6.83	--	NP	5.34	--
MW-20R	08/03/09	11:00	12.17	6.90	--	NP	5.27	--
MW-20R	08/17/09	9:15	12.17	7.18	--	NP	4.99	--
MW-20R	10/29/09	8:58	12.17	6.55	--	NP	5.62	--
MW-20R	01/18/10	13:27	12.17	4.60	--	NP	7.57	--
MW-20R	04/19/10	14:38	12.17	6.30	--	NP	5.87	--
MW-20R	07/19/10	7:06	12.17	6.94	--	NP	5.23	--
MW-20R	10/25/10	13:34	12.17	5.96	--	NP	6.21	--
MW-20R	03/21/11	12:19	12.17	5.73	--	NP	6.44	--
MW-20R	06/14/11	10:02	12.17	6.76	--	NP	5.41	--
MW-20R	09/26/11	10:47	12.17	6.83	--	NP	5.34	--
MW-20R	12/12/11	11:44	12.17	6.56	--	NP	5.61	--
MW-20R	03/27/12	13:49	12.17	5.98	--	NP	6.19	--
MW-20R	06/27/12	16:43	12.17	6.52	--	NP	5.65	--
MW-20R	09/25/12	7:24	12.17	7.09	--	NP	5.08	--
MW-20R	12/13/12	10:00	12.17	5.62	--	NP	6.55	--
MW-20R	03/25/13	10:02	12.17	6.64	--	NP	5.53	--
MW-20R	06/24/13	11:23	12.17	6.64	--	NP	5.53	--
MW-20R	09/23/13	13:32	12.17	6.34	--	NP	5.83	--
MW-20R	12/16/13	9:45	12.17	6.76	--	NP	5.41	--
MW-20R	03/26/14	7:30	12.17	6.04	--	NP	6.13	--
MW-20R	06/16/14	13:20	12.17	6.77	--	NP	5.40	--
MW-20R	09/29/14	13:32	12.17	6.28	--	NP	5.89	--
MW-20R	12/08/14	12:15	12.17	5.55	--	NP	6.62	--
MW-20R	03/23/15	13:15	12.17	6.13	--	NP	6.04	--
MW-20R	06/22/15	15:13	12.17	6.89	--	NP	5.28	--
MW-20R	10/27/16	9:01	12.17	5.66	--	NP	6.51	--
MW-20R	07/24/17	11:41	12.17	6.88	--	NP	5.29	--
MW-20R	03/19/18	12:20	12.17	6.44	--	NP	5.73	--
MW-20R	06/26/18	9:59	12.17	7.08	--	NP	5.09	--
MW-20R	09/21/18	8:59	12.17	6.95	--	NP	5.22	--
MW-20R	11/26/18	12:52	12.17	5.96	--	NP	6.21	--
MW-203	10/20/08	16:43	31.15	22.83	--	NP	8.32	--
MW-203	12/08/08	12:00	31.15	22.69	--	NP	8.46	--
MW-203	02/20/09	11:00	31.15	22.71	--	NP	8.44	--
MW-203	04/20/09	10:33	31.15	22.55	--	NP	8.60	--
MW-203	06/22/09	11:38	31.15	22.81	--	NP	8.34	--
MW-203	08/03/09	10:38	31.15	22.90	--	NP	8.25	--
MW-203	08/17/09	10:22	31.15	23.02	--	NP	8.13	--
MW-203	10/29/09	9:30	31.15	22.11	--	NP	9.04	--
MW-203	01/18/10	13:59	31.15	21.67	--	NP	9.48	--
MW-203	04/19/10	16:04	31.15	21.86	--	NP	9.29	--
MW-203	07/19/10	8:05	31.15	22.57	--	NP	8.58	--
MW-203	10/25/10	14:45	31.15	22.62	--	NP	8.53	--
MW-203	03/21/11	13:00	31.15	21.76	--	NP	9.39	--
MW-203	06/14/11	11:27	31.15	22.26	--	NP	8.89	--

**Table 3-3**  
**Groundwater Elevation Data**  
**Former Unocal Edmonds Bulk Fuel Terminal**  
**11720 Unoco Road**  
**Edmonds, Washington**

Monitoring Well	Date	Time	Top of Casing Elevation (feet)	Depth to Water (top of casing) (feet)	Depth to LNAPL (feet)	LNAPL Thickness (feet)	Groundwater Elevation (feet amsl)	Comment
MW-203	09/26/11	11:13	31.15	22.63	--	NP	8.52	--
MW-203	12/12/11	13:20	31.15	22.35	--	NP	8.80	--
MW-203	03/27/12	14:51	31.15	21.91	--	NP	9.24	--
MW-203	06/27/12	17:48	31.15	22.30	--	NP	8.85	--
MW-203	09/25/12	8:50	31.15	22.75	--	NP	8.40	--
MW-203	12/13/12	10:41	31.15	23.01	--	NP	8.14	--
MW-203	03/25/13	11:06	31.15	22.16	--	NP	8.99	--
MW-203	06/24/13	12:36	31.15	22.43	--	NP	8.72	--
MW-203	09/23/13	13:35	31.15	22.61	--	NP	8.54	--
MW-203	12/16/13	9:41	31.15	22.64	--	NP	8.51	--
MW-203	03/26/14	8:30	31.15	21.85	--	NP	9.30	--
MW-203	06/16/14	14:05	31.15	22.36	--	NP	8.79	--
MW-203	09/29/14	14:55	31.15	22.54	--	NP	8.61	--
MW-203	12/08/14	13:07	31.15	22.00	--	NP	9.15	--
MW-203	03/23/15	14:15	31.15	21.98	--	NP	9.17	--
MW-203	06/22/15	15:48	31.15	22.48	--	NP	8.67	--
MW-203	10/27/16	9:50	31.15	22.31	--	NP	8.84	--
MW-203	07/24/17	12:25	31.15	22.29	--	NP	8.86	--
MW-203	03/19/18	12:48	31.15	22.35	--	NP	8.80	--
MW-203	06/26/18	10:40	31.15	22.37	--	NP	8.78	--
MW-203	09/21/18	8:59	31.15	22.75	--	NP	8.40	--
MW-203	11/26/18	12:49	31.15	22.58	--	NP	8.57	--
MW-301	10/20/08	17:30	12.15	6.73	--	NP	5.42	--
MW-301	12/08/08	--	12.15	--	--	--	--	--
MW-301	02/20/09	11:22	12.15	6.53	--	NP	5.62	--
MW-301	04/20/09	10:55	12.15	7.44	--	NP	4.71	--
MW-301	06/22/09	10:36	12.15	7.25	--	NP	4.90	--
MW-301	08/03/09	11:44	12.15	7.42	--	NP	4.73	--
MW-301	08/17/09	10:28	12.15	7.92	--	NP	4.23	--
MW-301	10/29/09	10:00	12.15	7.26	--	NP	4.89	--
MW-301	01/18/10	14:11	12.15	4.95	--	NP	7.20	--
MW-301	04/19/10	16:25	12.15	7.05	--	NP	5.10	--
MW-301	07/19/10	8:34	12.15	7.62	--	NP	4.53	--
MW-301	10/25/10	15:07	12.15	6.05	--	NP	6.10	--
MW-301	03/21/11	13:26	12.15	6.36	--	NP	5.79	--
MW-301	06/14/11	11:50	12.15	7.57	--	NP	4.58	--
MW-301	09/26/11	11:50	12.15	7.27	--	NP	4.88	--
MW-301	12/12/11	14:15	12.15	6.78	--	NP	5.37	--
MW-301	03/27/12	14:51	12.15	6.60	--	NP	5.55	--
MW-301	06/27/12	18:10	12.15	7.05	--	NP	5.10	--
MW-301	09/25/12	9:05	12.15	7.70	--	NP	4.45	--
MW-301	12/13/12	10:58	12.15	5.94	--	NP	6.21	--
MW-301	03/25/13	11:40	12.15	7.30	--	NP	4.85	--
MW-301	06/24/13	12:58	12.15	7.36	--	NP	4.79	--
MW-301	09/23/13	15:00	12.15	6.66	--	NP	5.49	--
MW-301	12/16/13	11:20	12.15	6.95	--	NP	5.20	--
MW-301	03/26/14	9:05	12.15	6.46	--	NP	5.69	--
MW-301	06/16/14	14:45	12.15	7.40	--	NP	4.75	--
MW-301	09/29/14	15:05	12.15	6.59	--	NP	5.56	--
MW-301	12/08/14	12:58	12.15	5.73	--	NP	6.42	--
MW-301	03/23/15	15:01	12.15	7.00	--	NP	5.15	--
MW-301	06/22/15	15:54	12.15	7.39	--	NP	4.76	--
MW-301	10/27/16	10:15	12.15	6.21	--	NP	5.94	--
MW-301	07/24/17	--	--	--	--	--	--	Offsite well - Not part of the monitoring network
MW-500	10/20/08	16:32	16.64	8.71	--	NP	7.93	--
MW-500	12/08/08	11:45	16.64	5.16	--	NP	11.48	--
MW-500	02/20/09	10:46	16.64	4.51	--	NP	12.13	--
MW-500	04/20/09	10:19	16.64	3.54	--	NP	13.10	--
MW-500	06/22/09	11:28	16.64	5.18	--	NP	11.46	--
MW-500	08/03/09	10:20	16.64	6.15	--	NP	10.49	--
MW-500	08/17/09	9:48	16.64	6.51	--	NP	10.13	--
MW-500	10/29/09	9:05	16.64	4.94	--	NP	11.70	--
MW-500	01/18/10	13:16	16.64	1.69	--	NP	14.95	--
MW-500	04/19/10	15:50	16.64	3.77	--	NP	12.87	--
MW-500	07/19/10	7:45	16.64	5.39	--	NP	11.25	--
MW-500	10/25/10	14:35	16.64	5.51	--	NP	11.13	--
MW-500	03/21/11	12:54	16.64	2.20	--	NP	14.44	--
MW-500	06/14/11	11:17	16.64	4.71	--	NP	11.93	--
MW-500	09/26/11	11:00	16.64	6.94	--	NP	9.70	--
MW-500	12/12/11	13:00	16.64	4.39	--	NP	12.25	--
MW-500	03/27/12	14:36	16.64	2.61	--	NP	14.03	--
MW-500	06/27/12	17:35	16.64	4.65	--	NP	11.99	--
MW-500	09/25/12	8:17	16.64	6.57	--	NP	10.07	--

**Table 3-3**  
**Groundwater Elevation Data**  
**Former Unocal Edmonds Bulk Fuel Terminal**  
**11720 Unoco Road**  
**Edmonds, Washington**

Monitoring Well	Date	Time	Top of Casing Elevation (feet)	Depth to Water (top of casing) (feet)	Depth to LNAPL (feet)	LNAPL Thickness (feet)	Groundwater Elevation (feet amsl)	Comment
MW-500	12/13/12	10:28	16.64	2.27	--	NP	14.37	--
MW-500	03/25/13	10:50	16.64	3.54	--	NP	13.10	--
MW-500	06/24/13	12:20	16.64	5.61	--	NP	11.03	--
MW-500	09/23/13	14:07	16.64	6.22	--	NP	10.42	--
MW-500	12/16/13	10:50	16.64	5.20	--	NP	11.44	--
MW-500	03/26/14	8:46	16.64	2.63	--	NP	14.01	--
MW-500	06/16/14	13:44	16.64	5.48	--	NP	11.16	--
MW-500	09/29/14	15:40	16.64	6.55	--	NP	10.09	--
MW-500	12/08/14	13:05	16.64	3.05	--	NP	13.59	--
MW-500	03/23/15	14:07	16.64	3.18	--	NP	13.46	--
MW-500	06/22/15	14:58	16.64	5.95	--	NP	10.69	--
MW-500	10/27/16	9:45	16.64	2.00	--	NP	14.64	--
MW-500	07/24/17	11:58	16.64	5.85	--	NP	10.79	--
MW-500	03/19/18	12:58	16.64	3.85	--	NP	12.79	--
MW-500	06/26/18	10:10	16.64	5.84	--	NP	10.80	--
MW-500	09/21/18	9:05	16.64	7.28	--	NP	9.36	--
MW-500	11/26/18	12:33	16.64	4.65	--	NP	11.99	--
MW-501	10/20/08	16:30	15.24	7.27	--	NP	7.97	--
MW-501	12/08/08	11:43	15.24	5.20	--	NP	10.04	--
MW-501	02/20/09	10:44	15.24	3.43	--	NP	11.81	--
MW-501	04/20/09	10:17	15.24	2.50	--	NP	12.74	--
MW-501	06/22/09	11:31	15.24	3.98	--	NP	11.26	--
MW-501	08/03/09	10:22	15.24	4.95	--	NP	10.29	--
MW-501	08/17/09	9:46	15.24	5.51	--	NP	9.73	--
MW-501	10/29/09	9:02	15.24	3.01	--	NP	12.23	--
MW-501	01/18/10	13:23	15.24	0.56	--	NP	14.68	--
MW-501	04/19/10	15:48	15.24	2.54	--	NP	12.70	--
MW-501	07/19/10	7:44	15.24	4.36	--	NP	10.88	--
MW-501	10/25/10	14:35	15.24	4.57	--	NP	10.67	--
MW-501	03/21/11	12:48	15.24	1.31	--	NP	13.93	--
MW-501	06/14/11	11:12	15.24	3.51	--	NP	11.73	--
MW-501	09/26/11	11:12	15.24	6.01	--	NP	9.23	--
MW-501	12/12/11	12:56	15.24	3.28	--	NP	11.96	--
MW-501	03/27/12	14:53	15.24	1.79	--	NP	13.45	--
MW-501	06/27/12	17:47	15.24	3.38	--	NP	11.86	--
MW-501	09/25/12	8:15	15.24	5.78	--	NP	9.46	--
MW-501	12/13/12	10:25	15.24	1.36	--	NP	13.88	--
MW-501	03/25/13	10:54	15.24	2.35	--	NP	12.89	--
MW-501	06/24/13	12:18	15.24	4.24	--	NP	11.00	--
MW-501	09/23/13	14:08	15.24	5.52	--	NP	9.72	--
MW-501	12/16/13	11:25	15.24	4.01	--	NP	11.23	--
MW-501	03/26/14	8:41	15.24	1.75	--	NP	13.49	--
MW-501	06/16/14	13:53	15.24	4.12	--	NP	11.12	--
MW-501	09/29/14	15:47	15.24	6.49	--	NP	8.75	--
MW-501	12/08/14	12:50	15.24	2.20	--	NP	13.04	--
MW-501	03/23/15	14:41	15.24	2.45	--	NP	12.79	--
MW-501	06/22/15	14:59	15.24	4.85	--	NP	10.39	--
MW-501	10/27/16	9:54	15.24	1.39	--	NP	13.85	--
MW-501	07/24/17	12:02	15.24	4.67	--	NP	10.57	--
MW-501	03/19/18	13:09	15.24	4.69	--	NP	10.55	--
MW-501	06/26/18	10:15	15.24	4.90	--	NP	10.34	--
MW-501	09/21/18	9:20	15.24	6.71	--	NP	8.53	--
MW-501	11/26/18	12:32	15.24	6.39	--	NP	8.85	--
MW-502	10/20/08	16:25	13.00	5.41	--	NP	7.59	--
MW-502	12/08/08	11:20	13.00	5.16	--	NP	7.84	--
MW-502	02/20/09	10:24	13.00	5.03	--	NP	7.97	--
MW-502	04/20/09	10:40	13.00	4.98	--	NP	8.02	--
MW-502	06/22/09	11:49	13.00	5.35	--	NP	7.65	--
MW-502	08/03/09	11:34	13.00	5.53	--	NP	7.47	--
MW-502	08/17/09	9:39	13.00	5.56	--	NP	7.44	--
MW-502	10/29/09	9:40	13.00	5.03	--	NP	7.97	--
MW-502	01/18/10	13:55	13.00	3.78	--	NP	9.22	--
MW-502	04/19/10	15:42	13.00	4.47	--	NP	8.53	--
MW-502	07/19/10	7:24	13.00	5.25	--	NP	7.75	--
MW-502	10/25/10	14:15	13.00	5.20	--	NP	7.80	--
MW-502	03/21/11	12:43	13.00	4.05	--	NP	8.95	--
MW-502	06/14/11	11:05	13.00	4.90	--	NP	8.10	--
MW-502	09/26/11	11:10	13.00	5.46	--	NP	7.54	--
MW-502	12/12/11	13:26	13.00	4.91	--	NP	8.09	--
MW-502	03/27/12	14:26	13.00	4.32	--	NP	8.68	--
MW-502	06/27/12	17:24	13.00	4.93	--	NP	8.07	--
MW-502	09/25/12	8:01	13.00	6.50	--	NP	6.50	--
MW-502	12/13/12	10:22	13.00	4.31	--	NP	8.69	--

**Table 3-3**  
**Groundwater Elevation Data**  
**Former Unocal Edmonds Bulk Fuel Terminal**  
**11720 Unoco Road**  
**Edmonds, Washington**

Monitoring Well	Date	Time	Top of Casing Elevation (feet)	Depth to Water (top of casing) (feet)	Depth to LNAPL (feet)	LNAPL Thickness (feet)	Groundwater Elevation (feet amsl)	Comment
MW-502	03/25/13	10:31	13.00	4.71	--	NP	8.29	--
MW-502	06/24/13	12:38	13.00	5.20	--	NP	7.80	--
MW-502	09/23/13	14:20	13.00	5.22	--	NP	7.78	--
MW-502	12/16/13	10:39	13.00	5.27	--	NP	7.73	--
MW-502	03/26/14	8:24	13.00	4.38	--	NP	8.62	--
MW-502	06/16/14	13:50	13.00	5.10	--	NP	7.90	--
MW-502	09/29/14	15:39	13.00	5.20	--	NP	7.80	--
MW-502	12/08/14	12:37	13.00	4.51	--	NP	8.49	--
MW-502	03/23/15	14:27	13.00	4.50	--	NP	8.50	--
MW-502	06/22/15	15:55	13.00	5.28	--	NP	7.72	--
MW-502	10/27/16	10:05	13.00	4.80	--	NP	8.20	--
MW-502	07/24/17	11:51	13.00	5.35	--	NP	7.65	--
MW-502	03/19/18	12:50	13.00	5.22	--	NP	7.78	--
MW-502	06/26/18	10:24	13.00	5.96	--	NP	7.04	--
MW-502	09/21/18	8:14	13.00	5.72	--	NP	7.28	--
MW-502	11/26/18	12:57	13.00	5.56	--	NP	7.44	--
MW-503	10/20/08	16:23	12.22	5.75	--	NP	6.47	--
MW-503	12/08/08	11:23	12.22	5.42	--	NP	6.80	--
MW-503	02/20/09	10:21	12.22	5.25	--	NP	6.97	--
MW-503	04/20/09	10:42	12.22	5.00	--	NP	7.22	--
MW-503	06/22/09	11:48	12.22	5.56	--	NP	6.66	--
MW-503	08/03/09	11:33	12.22	5.75	--	NP	6.47	--
MW-503	08/17/09	9:37	12.22	5.76	--	NP	6.46	--
MW-503	10/29/09	9:39	12.22	5.00	--	NP	7.22	--
MW-503	01/18/10	13:54	12.22	3.66	--	NP	8.56	--
MW-503	04/19/10	15:40	12.22	4.69	--	NP	7.53	--
MW-503	07/19/10	7:26	12.22	5.45	--	NP	6.77	--
MW-503	10/25/10	14:12	12.22	5.19	--	NP	7.03	--
MW-503	03/21/11	12:42	12.22	4.10	--	NP	8.12	--
MW-503	06/14/11	11:01	12.22	5.10	--	NP	7.12	--
MW-503	09/26/11	11:07	12.22	5.55	--	NP	6.67	--
MW-503	12/12/11	13:30	12.22	5.07	--	NP	7.15	--
MW-503	03/27/12	14:24	12.22	4.47	--	NP	7.75	--
MW-503	06/27/12	17:22	12.22	5.05	--	NP	7.17	--
MW-503	09/25/12	7:59	12.22	5.61	--	NP	6.61	--
MW-503	12/13/12	10:20	12.22	4.40	--	NP	7.82	--
MW-503	03/25/13	10:35	12.22	4.83	--	NP	7.39	--
MW-503	06/24/13	11:54	12.22	5.33	--	NP	6.89	--
MW-503	09/23/13	14:35	12.22	5.26	--	NP	6.96	--
MW-503	12/16/13	10:35	12.22	5.40	--	NP	6.82	--
MW-503	03/26/14	8:22	12.22	4.56	--	NP	7.66	--
MW-503	06/16/14	13:48	12.22	5.22	--	NP	7.00	--
MW-503	09/29/14	15:41	12.22	5.13	--	NP	7.09	--
MW-503	12/08/14	12:35	12.22	4.55	--	NP	7.67	--
MW-503	03/23/15	14:10	12.22	5.09	--	NP	7.13	--
MW-503	06/22/15	15:57	12.22	5.32	--	NP	6.90	--
MW-503	10/27/16	10:06	12.22	4.22	--	NP	8.00	--
MW-503	07/24/17	11:53	12.22	5.38	--	NP	6.84	--
MW-503	03/19/18	12:48	12.22	5.12	--	NP	7.10	Well damaged
MW-503	06/26/18	11:05	12.22	5.80	--	NP	6.42	--
MW-503	09/21/18	9:31	12.22	5.36	--	NP	6.86	--
MW-503	11/26/18	13:01	12.22	5.18	--	NP	7.04	--
MW-504	10/20/08	16:14	13.32	7.01	--	NP	6.31	--
MW-504	12/08/08	11:26	13.32	6.63	--	NP	6.69	--
MW-504	02/20/09	10:16	13.32	6.46	--	NP	6.86	--
MW-504	04/20/09	10:03	13.32	6.25	--	NP	7.07	--
MW-504	06/22/09	11:42	13.32	6.81	--	NP	6.51	--
MW-504	08/03/09	11:29	13.32	7.00	--	NP	6.32	--
MW-504	08/17/09	9:35	13.32	7.05	--	NP	6.27	--
MW-504	10/29/09	9:26	13.32	6.28	--	NP	7.04	--
MW-504	01/18/10	13:53	13.32	4.90	--	NP	8.42	--
MW-504	04/19/10	15:37	13.32	5.99	--	NP	7.33	--
MW-504	07/19/10	7:28	13.32	6.80	--	NP	6.52	--
MW-504	10/25/10	14:10	13.32	6.66	--	NP	6.66	--
MW-504	03/21/11	12:40	13.32	5.48	--	NP	7.84	--
MW-504	06/14/11	10:57	13.32	6.48	--	NP	6.84	--
MW-504	09/26/11	11:05	13.32	7.09	--	NP	6.23	--
MW-504	12/12/11	12:07	13.32	6.42	--	NP	6.90	--
MW-504	03/27/12	14:22	13.32	5.84	--	NP	7.48	--
MW-504	06/27/12	17:20	13.32	6.40	--	NP	6.92	--
MW-504	09/25/12	7:57	13.32	7.07	--	NP	6.25	--
MW-504	12/13/12	10:18	13.32	5.80	--	NP	7.52	--
MW-504	03/25/13	10:33	13.32	6.22	--	NP	7.10	--



**Table 3-3**  
**Groundwater Elevation Data**  
**Former Unocal Edmonds Bulk Fuel Terminal**  
**11720 Unoco Road**  
**Edmonds, Washington**

Monitoring Well	Date	Time	Top of Casing Elevation (feet)	Depth to Water (top of casing) (feet)	Depth to LNAPL (feet)	LNAPL Thickness (feet)	Groundwater Elevation (feet amsl)	Comment
MW-504	06/24/13	11:57	13.32	6.80	--	NP	6.52	--
MW-504	09/23/13	13:55	13.32	6.67	--	NP	6.65	--
MW-504	12/16/13	10:37	13.32	6.85	--	NP	6.47	--
MW-504	03/26/14	8:21	13.32	6.00	--	NP	7.32	--
MW-504	06/16/14	13:46	13.32	6.69	--	NP	6.63	--
MW-504	09/29/14	15:45	13.32	6.61	--	NP	6.71	--
MW-504	12/08/14	12:33	13.32	5.64	--	NP	7.68	--
MW-504	03/23/15	13:57	13.32	6.05	--	NP	7.27	--
MW-504	06/22/15	15:59	13.32	5.32	--	NP	8.00	--
MW-504	10/27/16	9:13	13.32	5.52	--	NP	7.80	--
MW-504	07/24/17	12:00	13.32	6.85	--	NP	6.47	--
MW-504	03/19/18	12:42	13.32	6.56	--	NP	6.76	--
MW-504	06/26/18	10:26	13.32	7.13	--	NP	6.19	--
MW-504	09/21/18	8:49	13.32	6.94	--	NP	6.38	--
MW-504	11/26/18	13:03	13.32	6.70	--	NP	6.62	PID: 0.9
MW-505	10/20/08	16:11	11.42	5.10	--	NP	6.32	--
MW-505	12/08/08	11:13	11.42	4.72	--	NP	6.70	--
MW-505	02/20/09	10:18	11.42	4.53	--	NP	6.89	--
MW-505	04/20/09	10:02	11.42	4.32	--	NP	7.10	--
MW-505	06/22/09	11:39	11.42	4.90	--	NP	6.52	--
MW-505	08/03/09	11:28	11.42	5.11	--	NP	6.31	--
MW-505	08/17/09	9:33	11.42	5.13	--	NP	6.29	--
MW-505	10/29/09	9:25	11.42	4.37	--	NP	7.05	--
MW-505	01/18/10	13:52	11.42	2.99	--	NP	8.43	--
MW-505	04/19/10	15:35	11.42	4.08	--	NP	7.34	--
MW-505	07/19/10	7:31	11.42	5.89	--	NP	5.53	--
MW-505	10/25/10	14:08	11.42	4.73	--	NP	6.69	--
MW-505	03/21/11	12:39	11.42	3.45	--	NP	7.97	--
MW-505	06/14/11	10:58	11.42	4.58	--	NP	6.84	--
MW-505	09/26/11	10:54	11.42	5.14	--	NP	6.28	--
MW-505	12/12/11	12:09	11.42	4.50	--	NP	6.92	--
MW-505	03/27/12	14:11	11.42	3.94	--	NP	7.48	--
MW-505	06/27/12	17:16	11.42	4.49	--	NP	6.93	--
MW-505	09/25/12	7:55	11.42	5.13	--	NP	6.29	--
MW-505	12/13/12	10:15	11.42	3.88	--	NP	7.54	--
MW-505	03/25/13	10:31	11.42	4.30	--	NP	7.12	--
MW-505	06/24/13	11:52	11.42	4.84	--	NP	6.58	--
MW-505	09/23/13	13:53	11.42	4.76	--	NP	6.66	--
MW-505	12/16/13	10:27	11.42	4.91	--	NP	6.51	--
MW-505	03/26/14	8:17	11.42	4.10	--	NP	7.32	--
MW-505	06/16/14	13:44	11.42	4.75	--	NP	6.67	--
MW-505	09/29/14	15:47	11.42	4.69	--	NP	6.73	--
MW-505	12/08/14	12:30	11.42	4.10	--	NP	7.32	--
MW-505	03/23/15	13:56	11.42	4.13	--	NP	7.29	--
MW-505	06/22/15	16:01	11.42	4.88	--	NP	6.54	--
MW-505	10/27/16	9:14	11.42	3.63	--	NP	7.79	--
MW-505	07/24/17	12:17	11.42	4.92	--	NP	6.50	--
MW-505	03/19/18	12:40	11.42	4.65	--	NP	6.77	--
MW-505	06/26/18	10:21	11.42	5.23	--	NP	6.19	--
MW-505	09/21/18	9:35	11.42	5.05	--	NP	6.37	--
MW-505	11/26/18	13:04	11.42	4.78	--	NP	6.64	--
MW-506	10/20/08	16:16	13.44	7.13	--	NP	6.31	--
MW-506	12/08/08	11:29	13.44	6.75	--	NP	6.69	--
MW-506	02/20/09	10:13	13.44	6.60	--	NP	6.84	--
MW-506	04/20/09	10:08	13.44	6.37	--	NP	7.07	--
MW-506	06/22/09	11:44	13.44	6.93	--	NP	6.51	--
MW-506	08/03/09	11:30	13.44	7.13	--	NP	6.31	--
MW-506	08/17/09	9:31	13.44	7.17	--	NP	6.27	--
MW-506	10/29/09	9:28	13.44	6.39	--	NP	7.05	--
MW-506	01/18/10	13:47	13.44	5.02	--	NP	8.42	--
MW-506	04/19/10	15:30	13.44	6.10	--	NP	7.34	--
MW-506	07/19/10	7:37	13.44	6.91	--	NP	6.53	--
MW-506	10/25/10	14:10	13.44	6.75	--	NP	6.69	--
MW-506	03/21/11	12:40	13.44	5.50	--	NP	7.94	--
MW-506	06/14/11	10:48	13.44	6.59	--	NP	6.85	--
MW-506	09/26/11	11:00	13.44	7.13	--	NP	6.31	--
MW-506	12/12/11	12:14	13.44	6.56	--	NP	6.88	--
MW-506	03/27/12	14:15	13.44	5.93	--	NP	7.51	--
MW-506	06/27/12	17:20	13.44	6.51	--	NP	6.93	--
MW-506	09/25/12	7:52	13.44	7.15	--	NP	6.29	--
MW-506	12/13/12	10:10	13.44	5.89	--	NP	7.55	--
MW-506	03/25/13	10:33	13.44	6.33	--	NP	7.11	--
MW-506	06/24/13	12:03	13.44	6.88	--	NP	6.56	--

**Table 3-3**  
**Groundwater Elevation Data**  
**Former Unocal Edmonds Bulk Fuel Terminal**  
**11720 Unoco Road**  
**Edmonds, Washington**

Monitoring Well	Date	Time	Top of Casing Elevation (feet)	Depth to Water (top of casing) (feet)	Depth to LNAPL (feet)	LNAPL Thickness (feet)	Groundwater Elevation (feet amsl)	Comment
MW-506	09/23/13	13:57	13.44	6.76	--	NP	6.68	--
MW-506	12/16/13	10:28	13.44	6.93	--	NP	6.51	--
MW-506	03/26/14	9:12	13.44	6.09	--	NP	7.35	--
MW-506	06/16/14	13:48	13.44	6.79	--	NP	6.65	--
MW-506	09/29/14	13:54	13.44	6.71	--	NP	6.73	--
MW-506	12/08/14	12:45	13.44	6.07	--	NP	7.37	--
MW-506	03/23/15	14:03	13.44	6.15	--	NP	7.29	--
MW-506	06/22/15	15:25	13.44	6.89	--	NP	6.55	--
MW-506	10/27/16	9:48	13.44	5.62	--	NP	7.82	--
MW-506	07/24/17	12:01	13.44	6.91	--	NP	6.53	--
MW-506	03/19/18	12:43	13.44	6.60	--	NP	6.84	--
MW-506	06/26/18	10:20	13.44	7.21	--	NP	6.23	--
MW-506	09/21/18	8:47	13.44	7.01	--	NP	6.43	--
MW-506	11/26/18	13:06	13.44	6.78	--	NP	6.66	--
MW-507	10/20/08	16:09	13.60	7.38	--	NP	6.22	--
MW-507	12/08/08	11:11	13.60	7.09	--	NP	6.51	--
MW-507	02/20/09	10:11	13.60	6.91	--	NP	6.69	--
MW-507	04/20/09	10:00	13.60	6.70	--	NP	6.90	--
MW-507	06/22/09	11:37	13.60	7.23	--	NP	6.37	--
MW-507	08/03/09	11:27	13.60	7.41	--	NP	6.19	--
MW-507	08/17/09	9:29	13.60	7.45	--	NP	6.15	--
MW-507	10/29/09	9:23	13.60	6.70	--	NP	6.90	--
MW-507	01/18/10	13:48	13.60	5.49	--	NP	8.11	--
MW-507	04/19/10	15:29	13.60	6.40	--	NP	7.20	--
MW-507	07/19/10	7:36	13.60	7.14	--	NP	6.46	--
MW-507	10/25/10	14:09	13.60	6.90	--	NP	6.70	--
MW-507	03/21/11	12:38	13.60	5.86	--	NP	7.74	--
MW-507	06/14/11	10:44	13.60	6.95	--	NP	6.65	--
MW-507	09/26/11	11:01	13.60	7.40	--	NP	6.20	--
MW-507	12/12/11	12:17	13.60	6.81	--	NP	6.79	--
MW-507	03/27/12	14:10	13.60	6.23	--	NP	7.37	--
MW-507	06/27/12	17:17	13.60	6.79	--	NP	6.81	--
MW-507	09/25/12	7:49	13.60	7.38	--	NP	6.22	--
MW-507	12/13/12	10:12	13.60	6.19	--	NP	7.41	--
MW-507	03/25/13	10:31	13.60	6.56	--	NP	7.04	--
MW-507	06/24/13	12:02	13.60	7.05	--	NP	6.55	--
MW-507	09/23/13	13:52	13.60	7.03	--	NP	6.57	--
MW-507	12/16/13	10:26	13.60	7.15	--	NP	6.45	--
MW-507	03/26/14	8:40	13.60	6.41	--	NP	7.19	--
MW-507	06/16/14	13:46	13.60	7.01	--	NP	6.59	--
MW-507	09/29/14	13:53	13.60	6.92	--	NP	6.68	--
MW-507	12/08/14	12:41	13.60	6.35	--	NP	7.25	--
MW-507	03/23/15	13:54	13.60	6.47	--	NP	7.13	--
MW-507	06/22/15	15:26	13.60	7.17	--	NP	6.43	--
MW-507	10/27/16	9:47	13.60	5.84	--	NP	7.76	--
MW-507	07/24/17	12:05	13.60	7.07	--	NP	6.53	--
MW-507	03/19/18	12:42	13.60	6.82	--	NP	6.78	--
MW-507	06/26/18	10:16	13.60	7.37	--	NP	6.23	--
MW-507	09/21/18	8:44	13.60	7.21	--	NP	6.39	--
MW-507	11/26/18	13:08	13.60	6.85	--	NP	6.75	--
MW-508	10/20/08	16:07	13.31	7.16	--	NP	6.15	--
MW-508	12/08/08	11:09	13.31	6.33	--	NP	6.98	--
MW-508	02/20/09	10:08	13.31	6.70	--	NP	6.61	--
MW-508	04/20/09	9:59	13.31	6.40	--	NP	6.91	--
MW-508	06/22/09	11:35	13.31	6.94	--	NP	6.37	--
MW-508	08/03/09	11:26	13.31	7.15	--	NP	6.16	--
MW-508	08/17/09	9:28	13.31	7.20	--	NP	6.11	--
MW-508	10/29/09	9:22	13.31	6.55	--	NP	6.76	--
MW-508	01/18/10	13:49	13.31	5.13	--	NP	8.18	--
MW-508	04/19/10	15:27	13.31	6.11	--	NP	7.20	--
MW-508	07/19/10	7:33	13.31	6.88	--	NP	6.43	--
MW-508	10/25/10	14:07	13.31	6.58	--	NP	6.73	--
MW-508	03/21/11	12:36	13.31	5.51	--	NP	7.80	--
MW-508	06/14/11	10:40	13.31	6.70	--	NP	6.61	--
MW-508	09/26/11	10:57	13.31	7.18	--	NP	6.13	--
MW-508	12/12/11	12:21	13.31	6.55	--	NP	6.76	--
MW-508	03/29/12	14:06	13.31	5.92	--	NP	7.39	--
MW-508	06/27/12	18:18	13.31	6.42	--	NP	6.89	--
MW-508	09/25/12	7:45	13.31	7.11	--	NP	6.20	--
MW-508	12/13/12	10:40	13.31	5.85	--	NP	7.46	--
MW-508	03/25/13	10:29	13.31	6.24	--	NP	7.07	--
MW-508	06/24/13	11:50	13.31	6.73	--	NP	6.58	--
MW-508	09/23/13	13:49	13.31	6.82	--	NP	6.49	--

**Table 3-3**  
**Groundwater Elevation Data**  
**Former Unocal Edmonds Bulk Fuel Terminal**  
**11720 Unoco Road**  
**Edmonds, Washington**

Monitoring Well	Date	Time	Top of Casing Elevation (feet)	Depth to Water (top of casing) (feet)	Depth to LNAPL (feet)	LNAPL Thickness (feet)	Groundwater Elevation (feet amsl)	Comment
MW-508	12/16/13	10:25	13.31	6.95	--	NP	6.36	--
MW-508	03/26/14	9:30	13.31	5.90	--	NP	7.41	--
MW-508	06/16/14	13:42	13.31	6.68	--	NP	6.63	--
MW-508	09/29/14	13:51	13.31	6.69	--	NP	6.62	--
MW-508	12/08/14	12:37	13.31	6.03	--	NP	7.28	--
MW-508	03/23/15	13:51	13.31	6.17	--	NP	7.14	--
MW-508	06/22/15	15:31	13.31	6.93	--	NP	6.38	--
MW-508	10/27/16	9:45	13.31	5.40	--	NP	7.91	--
MW-508 <sup>DB2</sup>	07/24/17	12:06	13.31	6.81	--	NP	6.50	--
MW-509	10/20/08	16:05	10.28	3.97	--	NP	6.31	--
MW-509	12/08/08	11:07	10.28	3.59	--	NP	6.69	--
MW-509	02/20/09	10:06	10.28	3.39	--	NP	6.89	--
MW-509	04/20/09	9:36	10.28	3.18	--	NP	7.10	--
MW-509	06/22/09	11:33	10.28	3.75	--	NP	6.53	--
MW-509	08/03/09	11:11	10.28	3.95	--	NP	6.33	--
MW-509	08/17/09	9:27	10.28	6.97	--	NP	3.31	--
MW-509	10/29/09	9:10	10.28	3.23	--	NP	7.05	--
MW-509	01/18/10	13:50	10.28	1.85	--	NP	8.43	--
MW-509	04/19/10	15:26	10.28	2.93	--	NP	7.35	--
MW-509	07/19/10	7:18	10.28	3.77	--	NP	6.51	--
MW-509	10/25/10	14:49	10.28	4.59	--	NP	5.69	--
MW-509	03/21/11	12:30	10.28	2.34	--	NP	7.94	--
MW-509	06/14/11	10:17	10.28	3.43	--	NP	6.85	--
MW-509	09/26/11	10:55	10.28	4.20	--	NP	6.08	--
MW-509	12/12/11	12:27	10.28	3.36	--	NP	6.92	--
MW-509	03/27/12	13:57	10.28	2.78	--	NP	7.50	--
MW-509	06/27/12	17:06	10.28	3.33	--	NP	6.95	--
MW-509	09/25/12	7:42	10.28	4.00	--	NP	6.28	--
MW-509	12/13/12	10:13	10.28	2.73	--	NP	7.55	--
MW-509	03/25/13	10:26	10.28	3.18	--	NP	7.10	--
MW-509	06/24/13	11:34	10.28	3.37	--	NP	6.91	--
MW-509	09/23/13	13:50	10.28	3.62	--	NP	6.66	--
MW-509	12/16/13	11:25	10.28	3.80	--	NP	6.48	--
MW-509	03/26/14	8:24	10.28	2.93	--	NP	7.35	--
MW-509	06/16/14	13:36	10.28	3.64	--	NP	6.64	--
MW-509	09/29/14	14:30	10.28	3.56	--	NP	6.72	--
MW-509	12/08/14	12:05	10.28	2.92	--	NP	7.36	--
MW-509	03/23/15	13:47	10.28	2.98	--	NP	7.30	--
MW-509	06/25/15	11:41	10.28	3.74	--	NP	6.54	--
MW-509	10/27/16	9:17	10.28	2.48	--	NP	7.80	--
MW-509	07/24/17	11:53	10.28	3.80	--	NP	6.48	--
MW-509	03/19/18	12:35	10.28	3.58	--	NP	6.70	--
MW-509	06/26/18	10:19	10.28	4.06	--	NP	6.22	--
MW-509	09/21/18	9:19	10.28	3.85	--	NP	6.43	--
MW-509	11/26/18	13:18	10.28	3.64	--	NP	6.64	--
MW-510	10/20/08	16:03	12.53	6.47	--	NP	6.06	--
MW-510	12/08/08	10:49	12.53	6.45	--	NP	6.08	--
MW-510	02/20/09	9:51	12.53	6.35	--	NP	6.18	--
MW-510	04/20/09	9:46	12.53	6.72	--	NP	5.81	--
MW-510	06/22/09	11:31	12.53	7.05	--	NP	5.48	--
MW-510	08/03/09	11:15	12.53	7.08	--	<0.01	5.45	Sheen observed on probe, sheen observed on purge water
MW-510	08/17/09	9:24	12.53	7.29	--	<0.01	5.24	Film observed during gauging
MW-510	10/29/09	9:31	12.53	6.72	6.71	0.01	5.82	See **
MW-510	01/18/10	13:31	12.53	4.98	4.85	0.13	7.65	See **
MW-510	04/19/10	15:04	12.53	6.40	6.38	0.02	6.15	See **
MW-510	07/19/10	7:40	12.53	7.04	7.00	0.04	5.52	See **
MW-510	10/25/10	14:49	12.53	6.04	6.02	0.02	6.51	See **
MW-510	03/21/11	13:25	12.53	5.81	5.80	0.01	6.73	See **
MW-510	06/14/11	12:11	12.53	7.08	--	NP	5.45	--
MW-510	09/26/11	12:47	12.53	6.96	6.94	0.02	5.59	See **
MW-510	12/12/11	12:26	12.53	6.41	--	NP	6.12	--
MW-510	03/27/12	14:03	12.53	5.96	--	NP	6.57	--
MW-510	06/27/12	16:41	12.53	6.42	6.41	0.01	6.12	See **
MW-510	09/25/12	8:19	12.53	7.11	7.10	0.01	5.43	See **
MW-510	12/13/12	11:11	12.53	5.50	--	<0.01	7.03	Film observed during gauging, sheen observed on purge water
MW-510	03/25/13	10:16	12.53	6.34	--	<0.01	6.19	Film observed during gauging, sheen observed on purge water
MW-510	06/24/13	12:11	12.53	6.61	--	<0.01	5.92	Film observed during gauging, confirmed with bailer
MW-510	09/23/13	13:40	12.53	6.30	--	NP	6.23	--
MW-510	12/16/13	10:38	12.53	6.60	--	<0.01	5.93	Film observed during gauging, confirmed with bailer
MW-510	03/26/14	8:27	12.53	5.63	--	<0.01	6.90	Film observed during gauging, confirmed with bailer
MW-510	06/16/14	14:50	12.53	6.61	--	<0.01	5.92	Film observed during gauging
MW-510	09/29/14	14:18	12.53	6.26	--	<0.01	6.27	Film observed during gauging
MW-510	12/08/14	11:56	12.53	5.51	--	NP	7.02	--

**Table 3-3**  
**Groundwater Elevation Data**  
**Former Unocal Edmonds Bulk Fuel Terminal**  
**11720 Unoco Road**  
**Edmonds, Washington**

Monitoring Well	Date	Time	Top of Casing Elevation (feet)	Depth to Water (top of casing) (feet)	Depth to LNAPL (feet)	LNAPL Thickness (feet)	Groundwater Elevation (feet amsl)	Comment
MW-510	03/23/15	13:32	12.53	5.82	--	NP	6.71	--
MW-510	06/22/15	14:36	12.53	6.75	--	NP	5.78	--
MW-510	10/27/16	9:22	12.53	4.67	--	NP	7.86	--
MW-510 <sup>DB2</sup>	07/24/17	13:00	12.53	6.60	--	NP	5.93	--
MW-511	10/20/08	16:49	15.20	7.75	--	NP	7.45	--
MW-511	12/08/08	12:05	15.20	7.45	--	NP	7.75	--
MW-511	02/20/09	10:13	15.20	7.34	--	NP	7.86	--
MW-511	04/20/09	10:44	15.20	7.09	--	NP	8.11	--
MW-511	06/22/09	11:16	15.20	7.66	--	NP	7.54	--
MW-511	08/03/09	10:40	15.20	7.89	--	NP	7.31	--
MW-511	08/17/09	9:17	15.20	7.87	--	NP	7.33	--
MW-511	10/29/09	9:10	15.20	7.30	--	NP	7.90	--
MW-511	01/18/10	13:36	15.20	6.06	--	NP	9.14	--
MW-511	04/19/10	16:10	15.20	6.83	--	NP	8.37	--
MW-511	07/19/10	7:18	15.20	7.59	--	NP	7.61	--
MW-511	10/25/10	14:50	15.20	7.51	--	NP	7.69	--
MW-511	03/21/11	13:06	15.20	6.37	--	NP	8.83	--
MW-511	06/14/11	11:38	15.20	7.29	--	NP	7.91	--
MW-511	09/26/11	11:08	15.20	7.88	--	NP	7.32	--
MW-511	12/12/11	13:27	15.20	7.20	--	NP	8.00	--
MW-511	03/27/12	14:55	15.20	6.62	--	NP	8.58	--
MW-511	06/27/12	17:39	15.20	7.27	--	NP	7.93	--
MW-511	09/25/12	8:27	15.20	7.85	--	NP	7.35	--
MW-511	12/13/12	10:44	15.20	6.59	--	NP	8.61	--
MW-511	03/25/13	10:59	15.20	7.05	--	NP	8.15	--
MW-511	06/24/13	11:32	15.20	7.60	--	NP	7.60	--
MW-511	09/23/13	13:29	15.20	7.59	--	NP	7.61	--
MW-511	12/16/13	11:27	15.20	7.60	--	NP	7.60	--
MW-511	03/26/14	8:24	15.20	6.74	--	NP	8.46	--
MW-511	06/16/14	13:35	15.20	7.50	--	NP	7.70	--
MW-511	09/29/14	15:16	15.20	7.59	--	NP	7.61	--
MW-511	12/08/14	11:50	15.20	6.89	--	NP	8.31	--
MW-511	03/23/15	13:29	15.20	6.86	--	NP	8.34	--
MW-511	06/22/15	15:42	15.20	7.70	--	NP	7.50	--
MW-511	10/27/16	9:10	15.20	7.38	--	NP	7.82	--
MW-511	07/24/17	11:49	15.20	8.06	--	NP	7.14	--
MW-511	03/19/18	12:42	15.20	7.92	--	NP	7.28	--
MW-511	06/26/18	11:06	15.20	8.70	--	NP	6.50	--
MW-511	09/21/18	9:40	15.20	8.35	--	NP	6.85	--
MW-511	11/26/18	12:53	15.20	8.33	--	NP	6.87	--
MW-512	10/20/08	16:04	13.19	6.90	--	NP	6.29	--
MW-512	12/08/08	10:37	13.19	6.51	--	NP	6.68	--
MW-512	02/20/09	10:10	13.19	6.30	--	NP	6.89	--
MW-512	04/20/09	9:28	13.19	6.12	--	NP	7.07	--
MW-512	06/22/09	11:18	13.19	7.68	--	NP	5.51	--
MW-512	08/03/09	11:09	13.19	6.86	--	NP	6.33	--
MW-512	08/17/09	9:18	13.19	6.91	--	NP	6.28	--
MW-512	10/29/09	9:07	13.19	6.15	--	NP	7.04	--
MW-512	01/18/10	13:34	13.19	4.78	--	NP	8.41	--
MW-512	04/19/10	14:48	13.19	5.85	--	NP	7.34	--
MW-512	07/19/10	7:16	13.19	6.67	--	NP	6.52	--
MW-512	10/25/10	13:48	13.19	6.51	--	NP	6.68	--
MW-512	03/21/11	12:22	13.19	5.26	--	NP	7.93	--
MW-512	06/14/11	10:16	13.19	6.35	--	NP	6.84	--
MW-512	09/26/11	11:53	13.19	6.95	--	NP	6.24	--
MW-512	12/12/11	11:59	13.19	6.29	--	NP	6.90	--
MW-512	03/27/12	13:52	13.19	5.72	--	NP	7.47	--
MW-512	06/27/12	17:00	13.19	6.27	--	NP	6.92	--
MW-512	09/25/12	7:30	13.19	6.93	--	NP	6.26	--
MW-512	12/13/12	10:15	13.19	5.65	--	NP	7.54	--
MW-512	03/25/13	10:20	13.19	6.11	--	NP	7.08	--
MW-512	06/24/13	11:37	13.19	6.67	--	NP	6.52	--
MW-512	09/23/13	13:40	13.19	6.57	--	NP	6.62	--
MW-512	12/16/13	10:09	13.19	6.72	--	NP	6.47	--
MW-512	03/26/14	8:12	13.19	5.88	--	NP	7.31	--
MW-512	06/16/14	13:31	13.19	6.56	--	NP	6.63	--
MW-512	09/29/14	15:25	13.19	6.50	--	NP	6.69	--
MW-512	12/08/14	11:55	13.19	5.90	--	NP	7.29	--
MW-512	03/23/15	13:32	13.19	5.91	--	NP	7.28	--
MW-512	06/22/15	15:38	13.19	6.70	--	NP	6.49	--
MW-512	10/27/16	9:09	13.19	5.40	--	NP	7.79	--
MW-512	07/24/17	12:25	13.19	6.73	--	NP	6.46	--
MW-512	03/19/18	12:54	13.19	6.44	--	NP	6.75	--

**Table 3-3**  
**Groundwater Elevation Data**  
**Former Unocal Edmonds Bulk Fuel Terminal**  
**11720 Unoco Road**  
**Edmonds, Washington**

Monitoring Well	Date	Time	Top of Casing Elevation (feet)	Depth to Water (top of casing) (feet)	Depth to LNAPL (feet)	LNAPL Thickness (feet)	Groundwater Elevation (feet amsl)	Comment
MW-512	06/26/18	11:08	13.19	7.08	--	NP	6.11	--
MW-512	09/21/18	9:34	13.19	6.84	--	NP	6.35	--
MW-512	11/26/18	13:14	13.19	6.62	--	NP	6.57	--
MW-513	10/20/08	16:01	11.09	4.78	--	NP	6.31	--
MW-513	12/08/08	10:41	11.09	4.40	--	NP	6.69	--
MW-513	02/20/09	10:07	11.09	4.19	--	NP	6.90	--
MW-513	04/20/09	9:30	11.09	4.00	--	NP	7.09	--
MW-513	06/22/09	11:21	11.09	4.58	--	NP	6.51	--
MW-513	08/03/09	11:08	11.09	4.78	--	NP	6.31	--
MW-513	08/17/09	9:21	11.09	4.80	--	NP	6.29	--
MW-513	10/29/09	9:13	11.09	4.04	--	NP	7.05	--
MW-513	01/18/10	13:37	11.09	2.67	--	NP	8.42	--
MW-513	04/19/10	14:51	11.09	3.75	--	NP	7.34	--
MW-513	07/19/10	7:12	11.09	4.57	--	NP	6.52	--
MW-513	10/25/10	13:44	11.09	4.42	--	NP	6.67	--
MW-513	03/21/11	12:25	11.09	3.18	--	NP	7.91	--
MW-513	06/14/11	10:12	11.09	4.25	--	NP	6.84	--
MW-513	09/26/11	10:54	11.09	4.83	--	NP	6.26	--
MW-513	12/12/11	11:57	11.09	4.19	--	NP	6.90	--
MW-513	03/27/12	13:56	11.09	3.60	--	NP	7.49	--
MW-513	06/27/12	16:58	11.09	4.15	--	NP	6.94	--
MW-513	09/25/12	7:35	11.09	4.82	--	NP	6.27	--
MW-513	12/13/12	10:13	11.09	3.56	--	NP	7.53	--
MW-513	03/25/13	10:16	11.09	3.90	--	NP	7.19	--
MW-513	06/24/13	11:40	11.09	4.55	--	NP	6.54	--
MW-513	09/23/13	13:46	11.09	4.47	--	NP	6.62	--
MW-513	12/16/13	10:12	11.09	4.62	--	NP	6.47	--
MW-513	03/26/14	8:14	11.09	3.77	--	NP	7.32	--
MW-513	06/16/14	13:41	11.09	4.46	--	NP	6.63	--
MW-513	09/29/14	15:29	11.09	4.38	--	NP	6.71	--
MW-513	12/08/14	12:00	11.09	3.74	--	NP	7.35	--
MW-513	03/23/15	13:35	11.09	3.81	--	NP	7.28	--
MW-513	06/22/15	15:31	11.09	4.58	--	NP	6.51	--
MW-513	10/27/16	9:08	11.09	3.30	--	NP	7.79	--
MW-513	07/24/17	12:01	11.09	4.62	--	NP	6.47	--
MW-513	03/19/18	13:24	11.09	4.35	--	NP	6.74	--
MW-513	06/26/18	10:12	11.09	4.92	--	NP	6.17	--
MW-513	09/21/18	9:29	11.09	4.70	--	NP	6.39	--
MW-513	11/26/18	13:09	11.09	4.49	--	NP	6.60	--
MW-514	10/20/08	16:02	11.39	5.09	--	NP	6.30	--
MW-514	12/08/08	10:35	11.39	4.70	--	NP	6.69	--
MW-514	02/20/09	10:08	11.39	4.19	--	NP	7.20	--
MW-514	04/20/09	9:28	11.39	4.31	--	NP	7.08	--
MW-514	06/22/09	11:19	11.39	4.88	--	NP	6.51	--
MW-514	08/03/09	11:07	11.39	5.08	--	NP	6.31	--
MW-514	08/17/09	9:19	11.39	5.11	--	NP	6.28	--
MW-514	10/29/09	9:06	11.39	4.35	--	NP	7.04	--
MW-514	01/18/10	13:33	11.39	2.98	--	NP	8.41	--
MW-514	04/19/10	14:46	11.39	4.05	--	NP	7.34	--
MW-514	07/19/10	7:10	11.39	4.97	--	NP	6.42	--
MW-514	10/25/10	13:41	11.39	4.71	--	NP	6.68	--
MW-514	03/21/11	12:23	11.39	3.48	--	NP	7.91	--
MW-514	06/14/11	10:14	11.39	4.56	--	NP	6.83	--
MW-514	09/26/11	10:50	11.39	5.13	--	NP	6.26	--
MW-514	12/12/11	11:55	11.39	4.49	--	NP	6.90	--
MW-514	03/27/12	13:54	11.39	3.92	--	NP	7.47	--
MW-514	06/27/12	16:56	11.39	4.47	--	NP	6.92	--
MW-514	09/25/12	7:32	11.39	5.13	--	NP	6.26	--
MW-514	12/13/12	10:14	11.39	3.84	--	NP	7.55	--
MW-514	03/25/13	9:50	11.39	7.62	--	NP	3.77	See*
MW-514	06/24/13	11:39	11.39	4.84	--	NP	6.55	--
MW-514	09/23/13	13:38	11.39	4.76	--	NP	6.63	--
MW-514	12/16/13	10:10	11.39	4.92	--	NP	6.47	--
MW-514	03/26/14	8:00	11.39	4.05	--	NP	7.34	--
MW-514	06/16/14	13:39	11.39	4.76	--	NP	6.63	--
MW-514	09/29/14	15:27	11.39	4.69	--	NP	6.70	--
MW-514	12/08/14	11:57	11.39	4.10	--	NP	7.29	--
MW-514	03/23/15	13:33	11.39	4.12	--	NP	7.27	--
MW-514	06/22/15	15:28	11.39	4.88	--	NP	6.51	--
MW-514	10/27/16	9:08	11.39	3.61	--	NP	7.78	--
MW-514	07/24/17	12:39	11.39	4.92	--	NP	6.47	--
MW-514	03/19/18	12:55	11.39	4.65	--	NP	6.74	--
MW-514	06/26/18	10:10	11.39	5.23	--	NP	6.16	--

**Table 3-3**  
**Groundwater Elevation Data**  
**Former Unocal Edmonds Bulk Fuel Terminal**  
**11720 Unoco Road**  
**Edmonds, Washington**

Monitoring Well	Date	Time	Top of Casing Elevation (feet)	Depth to Water (top of casing) (feet)	Depth to LNAPL (feet)	LNAPL Thickness (feet)	Groundwater Elevation (feet amsl)	Comment
MW-514	09/21/18	9:31	11.39	5.01	--	NP	6.38	--
MW-514	11/26/18	13:12	11.39	4.81	--	NP	6.58	--
MW-515	10/20/08	16:00	11.60	5.30	--	NP	6.30	--
MW-515	12/08/08	10:42	11.60	4.91	--	NP	6.69	--
MW-515	02/20/09	9:47	11.60	5.70	--	NP	5.90	--
MW-515	04/20/09	9:25	11.60	4.52	--	NP	7.08	--
MW-515	06/22/09	11:25	11.60	5.09	--	NP	6.51	--
MW-515	08/03/09	11:04	11.60	5.29	--	NP	6.31	--
MW-515	08/17/09	9:23	11.60	5.33	--	NP	6.27	--
MW-515	10/29/09	9:15	11.60	4.55	--	NP	7.05	--
MW-515	01/18/10	13:40	11.60	3.18	--	NP	8.42	--
MW-515	04/19/10	14:54	11.60	4.26	--	NP	7.34	--
MW-515	07/19/10	7:12	11.60	5.10	--	NP	6.50	--
MW-515	10/25/10	13:45	11.60	4.93	--	NP	6.67	--
MW-515	03/21/11	12:26	11.60	3.65	--	NP	7.95	--
MW-515	06/14/11	10:14	11.60	4.75	--	NP	6.85	--
MW-515	09/26/11	10:52	11.60	5.35	--	NP	6.25	--
MW-515	12/12/11	12:01	11.60	4.71	--	NP	6.89	--
MW-515	03/27/12	13:56	11.60	4.11	--	NP	7.49	--
MW-515	06/27/12	17:00	11.60	4.68	--	NP	6.92	--
MW-515	09/25/12	7:35	11.60	5.34	--	NP	6.26	--
MW-515	12/13/12	10:12	11.60	4.06	--	NP	7.54	--
MW-515	03/25/13	10:10	11.60	4.53	--	NP	7.07	--
MW-515	06/24/13	11:45	11.60	5.06	--	NP	6.54	--
MW-515	09/23/13	13:40	11.60	4.96	--	NP	6.64	--
MW-515	12/16/13	10:19	11.60	5.15	--	NP	6.45	--
MW-515	03/26/14	8:18	11.60	4.26	--	NP	7.34	--
MW-515	06/16/14	13:30	11.60	4.98	--	NP	6.62	--
MW-515	09/29/14	15:35	11.60	4.89	--	NP	6.71	--
MW-515	12/08/14	12:03	11.60	4.27	--	NP	7.33	--
MW-515	03/23/15	13:45	11.60	4.33	--	NP	7.27	--
MW-515	06/22/15	15:29	11.60	5.09	--	NP	6.51	--
MW-515	10/27/16	9:05	11.60	3.81	--	NP	7.79	--
MW-515	07/24/17	11:55	11.60	5.11	--	NP	6.49	--
MW-515	03/19/18	12:31	11.60	4.83	--	NP	6.77	--
MW-515	06/26/18	10:11	11.60	5.44	--	NP	6.16	--
MW-515	09/21/18	9:22	11.60	5.22	--	NP	6.38	--
MW-515	11/26/18	13:03	11.60	5.01	--	NP	6.59	--
MW-516	10/20/08	15:59	11.25	4.94	--	NP	6.31	--
MW-516	12/08/08	10:33	11.25	4.56	--	NP	6.69	--
MW-516	02/20/09	9:49	11.25	4.35	--	NP	6.90	--
MW-516	04/20/09	9:26	11.25	4.17	--	NP	7.08	--
MW-516	06/22/09	11:24	11.25	4.75	--	NP	6.50	--
MW-516	08/03/09	11:05	11.25	4.94	--	NP	6.31	--
MW-516	08/17/09	9:24	11.25	4.96	--	NP	6.29	--
MW-516	10/29/09	9:14	11.25	4.22	--	NP	7.03	--
MW-516	01/18/10	13:39	11.25	2.84	--	NP	8.41	--
MW-516	04/19/10	14:52	11.25	3.91	--	NP	7.34	--
MW-516	07/19/10	7:11	11.25	4.75	--	NP	6.50	--
MW-516	10/25/10	13:44	11.25	5.38	--	NP	5.87	--
MW-516	03/21/11	12:25	11.25	3.30	--	NP	7.95	--
MW-516	06/14/11	10:12	11.25	4.41	--	NP	6.84	--
MW-516	09/26/11	10:50	11.25	5.00	--	NP	6.25	--
MW-516	12/12/11	11:48	11.25	4.36	--	NP	6.89	--
MW-516	03/27/12	13:55	11.25	3.79	--	NP	7.46	--
MW-516	06/27/12	16:58	11.25	4.33	--	NP	6.92	--
MW-516	09/25/12	7:32	11.25	4.99	--	NP	6.26	--
MW-516	12/13/12	10:11	11.25	3.71	--	NP	7.54	--
MW-516	03/25/13	10:09	11.25	4.17	--	NP	7.08	--
MW-516	06/24/13	11:43	11.25	4.71	--	NP	6.54	--
MW-516	09/23/13	13:39	11.25	4.62	--	NP	6.63	--
MW-516	12/16/13	10:16	11.25	4.81	--	NP	6.44	--
MW-516	03/26/14	7:50	11.25	3.92	--	NP	7.33	--
MW-516	06/16/14	13:28	11.25	4.63	--	NP	6.62	--
MW-516	09/29/14	15:32	11.25	4.56	--	NP	6.69	--
MW-516	12/08/14	12:25	11.25	3.92	--	NP	7.33	--
MW-516	03/23/15	13:43	11.25	3.99	--	NP	7.26	--
MW-516	06/22/15	15:31	11.25	4.75	--	NP	6.50	--
MW-516	10/27/16	9:06	11.25	3.49	--	NP	7.76	--
MW-516	07/24/17	11:58	11.25	4.82	--	NP	6.43	--
MW-516	03/19/18	12:29	11.25	4.51	--	NP	6.74	--
MW-516	06/26/18	10:09	11.25	5.09	--	NP	6.16	--
MW-516	09/21/18	9:24	11.25	4.86	--	NP	6.39	--

**Table 3-3**  
**Groundwater Elevation Data**  
**Former Unocal Edmonds Bulk Fuel Terminal**  
**11720 Unoco Road**  
**Edmonds, Washington**

Monitoring Well	Date	Time	Top of Casing Elevation (feet)	Depth to Water (top of casing) (feet)	Depth to LNAPL (feet)	LNAPL Thickness (feet)	Groundwater Elevation (feet amsl)	Comment
MW-516	11/26/18	12:58	11.25	4.65	--	NP	6.60	--
MW-517	10/20/08	15:57	12.00	5.69	--	NP	6.31	--
MW-517	12/08/08	10:31	12.00	5.31	--	NP	6.69	--
MW-517	02/20/09	9:51	12.00	5.12	--	NP	6.88	--
MW-517	04/20/09	9:27	12.00	4.91	--	NP	7.09	--
MW-517	06/22/09	11:22	12.00	5.49	--	NP	6.51	--
MW-517	08/03/09	11:06	12.00	5.68	--	NP	6.32	--
MW-517	08/17/09	9:25	12.00	5.72	--	NP	6.28	--
MW-517	10/29/09	9:05	12.00	4.97	--	NP	7.03	--
MW-517	01/18/10	13:31	12.00	3.58	--	NP	8.42	--
MW-517	04/19/10	14:44	12.00	4.66	--	NP	7.34	--
MW-517	07/19/10	7:08	12.00	5.49	--	NP	6.51	--
MW-517	10/25/10	13:42	12.00	5.33	--	NP	6.67	--
MW-517	03/21/11	12:24	12.00	4.05	--	NP	7.95	--
MW-517	06/14/11	10:08	12.00	5.16	--	NP	6.84	--
MW-517	09/26/11	10:49	12.00	5.77	--	NP	6.23	--
MW-517	12/12/11	11:51	12.00	5.11	--	NP	6.89	--
MW-517	03/27/12	13:54	12.00	4.52	--	NP	7.48	--
MW-517	06/27/12	16:54	12.00	5.08	--	NP	6.92	--
MW-517	09/25/12	7:30	12.00	5.78	--	NP	6.22	--
MW-517	12/13/12	10:10	12.00	4.46	--	NP	7.54	--
MW-517	03/25/13	10:08	12.00	4.93	--	NP	7.07	--
MW-517	06/24/13	11:41	12.00	5.48	--	NP	6.52	--
MW-517	09/23/13	13:35	12.00	5.38	--	NP	6.62	--
MW-517	12/16/13	10:13	12.00	5.55	--	NP	6.45	--
MW-517	03/26/14	7:55	12.00	4.69	--	NP	7.31	--
MW-517	06/16/14	13:26	12.00	5.38	--	NP	6.62	--
MW-517	09/29/14	15:31	12.00	5.30	--	NP	6.70	--
MW-517	12/08/14	12:22	12.00	4.68	--	NP	7.32	--
MW-517	03/23/15	13:40	12.00	4.73	--	NP	7.27	--
MW-517	06/22/15	15:27	12.00	5.49	--	NP	6.51	--
MW-517	10/27/16	9:07	12.00	4.22	--	NP	7.78	--
MW-517	07/24/17	12:00	12.00	5.55	--	NP	6.45	--
MW-517	03/19/18	12:28	12.00	5.27	--	NP	6.73	--
MW-517	06/26/18	10:08	12.00	5.82	--	NP	6.18	--
MW-517	09/21/18	9:26	12.00	5.62	--	NP	6.38	--
MW-517	11/26/18	13:02	12.00	5.42	--	NP	6.58	--
MW-518	10/20/08	15:56	14.60	8.51	--	NP	6.09	--
MW-518	12/08/08	10:44	14.60	8.37	--	NP	6.23	--
MW-518	02/20/09	9:45	14.60	8.29	--	NP	6.31	--
MW-518	04/20/09	9:17	14.60	8.40	--	NP	6.20	--
MW-518	06/22/09	11:29	14.60	8.68	--	NP	5.92	--
MW-518	08/03/09	11:04	14.60	8.79	--	NP	5.81	--
MW-518	08/17/09	9:20	14.60	9.00	--	NP	5.60	--
MW-518	10/29/09	9:19	14.60	8.42	--	NP	6.18	--
MW-518	01/18/10	13:43	14.60	6.65	--	NP	7.95	--
MW-518	04/19/10	14:56	14.60	8.01	--	NP	6.59	--
MW-518	07/19/10	7:14	14.60	8.73	--	NP	5.87	--
MW-518	10/25/10	13:47	14.60	8.05	--	NP	6.55	--
MW-518	03/21/11	12:27	14.60	7.45	--	NP	7.15	--
MW-518	06/14/11	10:09	14.60	8.45	--	NP	6.15	--
MW-518	09/26/11	10:52	14.60	8.73	--	NP	5.87	--
MW-518	12/12/11	12:03	14.60	7.30	--	NP	7.30	--
MW-518	03/27/12	13:57	14.60	7.75	--	NP	6.85	--
MW-518	06/27/12	17:02	14.60	8.28	--	NP	6.32	--
MW-518	09/25/12	7:37	14.60	8.96	--	NP	5.64	--
MW-518	12/13/12	10:09	14.60	7.49	--	NP	7.11	--
MW-518	03/25/13	10:11	14.60	8.30	--	NP	6.30	--
MW-518	06/24/13	11:30	14.60	8.44	--	NP	6.16	--
MW-518	09/23/13	13:41	14.60	8.32	--	NP	6.28	--
MW-518	12/16/13	11:56	14.60	8.65	--	NP	5.95	--
MW-518	03/26/14	8:20	14.60	7.82	--	NP	6.78	--
MW-518	06/16/14	13:32	14.60	8.53	--	NP	6.07	--
MW-518	09/29/14	13:43	14.60	8.25	--	NP	6.35	--
MW-518	12/08/14	12:30	14.60	7.57	--	NP	7.03	--
MW-518	03/23/15	13:50	14.60	7.92	--	NP	6.68	--
MW-518	06/22/15	15:24	14.60	8.70	--	NP	5.90	--
MW-518	10/27/16	9:04	14.60	7.47	--	NP	7.13	--
MW-518	07/24/17	11:47	14.60	8.62	--	NP	5.98	--
MW-518	03/19/18	12:33	14.60	8.29	--	NP	6.31	--
MW-518	06/26/18	10:15	14.60	8.95	--	NP	5.65	--
MW-518	09/21/18	9:07	14.60	8.73	--	NP	5.87	--
MW-518	11/26/18	13:07	14.60	8.12	--	NP	6.48	--

**Table 3-3**  
**Groundwater Elevation Data**  
**Former Unocal Edmonds Bulk Fuel Terminal**  
**11720 Unoco Road**  
**Edmonds, Washington**

Monitoring Well	Date	Time	Top of Casing Elevation (feet)	Depth to Water (top of casing) (feet)	Depth to LNAPL (feet)	LNAPL Thickness (feet)	Groundwater Elevation (feet amsl)	Comment
MW-518	02/07/19	11:58	14.60	8.24	--	NP	6.36	Not part of the quarterly monitoring program; gauged out of low tide window
MW-519	10/20/08	15:35	12.60	7.25	--	NP	5.35	--
MW-519	12/08/08	10:25	12.60	7.12	--	NP	5.48	--
MW-519	02/20/09	10:21	12.60	6.89	--	NP	5.71	--
MW-519	04/20/09	9:02	12.60	7.17	--	NP	5.43	--
MW-519	06/22/09	11:04	12.60	6.83	--	NP	5.77	--
MW-519	08/03/09	10:57	12.60	6.96	--	NP	5.64	--
MW-519	08/17/09	8:47	12.60	7.21	--	NP	5.39	--
MW-519	10/29/09	8:56	12.60	6.75	--	NP	5.85	--
MW-519	01/18/10	13:25	12.60	4.80	--	NP	7.80	--
MW-519	04/19/10	14:37	12.60	6.41	--	NP	6.19	--
MW-519	07/19/10	7:05	12.60	7.15	--	NP	5.45	--
MW-519	10/25/10	13:36	12.60	6.60	--	NP	6.00	--
MW-519	03/21/11	12:19	12.60	5.71	--	NP	6.89	--
MW-519	06/14/11	10:03	12.60	6.88	--	NP	5.72	--
MW-519	09/26/11	10:37	12.60	7.11	--	NP	5.49	--
MW-519	12/12/11	11:42	12.60	7.14	--	NP	5.46	--
MW-519	03/27/12	13:46	12.60	6.14	--	NP	6.46	--
MW-519	06/27/12	16:42	12.60	6.84	--	NP	5.76	--
MW-519	09/25/12	7:20	12.60	7.26	--	NP	5.34	--
MW-519	12/13/12	9:54	12.60	6.01	--	NP	6.59	--
MW-519	03/25/13	9:59	12.60	6.99	--	NP	5.61	--
MW-519	06/24/13	11:24	12.60	6.90	--	NP	5.70	--
MW-519	09/23/13	13:30	12.60	6.83	--	NP	5.77	--
MW-519	12/16/13	9:48	12.60	7.34	--	NP	5.26	--
MW-519	03/26/14	7:54	12.60	6.62	--	NP	5.98	--
MW-519	06/16/14	13:20	12.60	6.92	--	NP	5.68	--
MW-519	09/29/14	15:04	12.60	6.68	--	NP	5.92	--
MW-519	12/08/14	11:37	12.60	6.02	--	NP	6.58	--
MW-519	03/23/15	13:17	12.60	6.30	--	NP	6.30	--
MW-519	06/22/15	15:19	12.60	7.09	--	NP	5.51	--
MW-519	10/27/16	8:57	12.60	5.75	--	NP	6.85	--
MW-519	07/24/17	11:45	12.60	7.02	--	NP	5.58	--
MW-519	03/19/18	12:19	12.60	6.70	--	NP	5.90	--
MW-519	06/26/18	9:55	12.60	7.29	--	NP	5.31	--
MW-519	09/21/18	8:45	12.60	7.17	--	NP	5.43	--
MW-519	11/26/18	12:42	12.60	6.60	--	NP	6.00	--
MW-520	10/20/08	15:50	13.31	7.95	--	NP	5.36	--
MW-520	12/08/08	10:23	13.31	7.83	--	NP	5.48	--
MW-520	02/20/09	9:23	13.31	7.61	--	NP	5.70	--
MW-520	04/20/09	9:05	13.31	7.88	--	NP	5.43	--
MW-520	06/22/09	11:19	13.31	7.55	--	NP	5.76	--
MW-520	08/03/09	10:56	13.31	7.69	--	NP	5.62	--
MW-520	08/17/09	8:49	13.31	7.92	--	NP	5.39	--
MW-520	10/29/09	8:55	13.31	7.46	--	NP	5.85	--
MW-520	01/18/10	13:26	13.31	5.51	--	NP	7.80	--
MW-520	04/19/10	14:35	13.31	7.12	--	NP	6.19	--
MW-520	07/19/10	7:03	13.31	7.85	--	NP	5.46	--
MW-520	10/25/10	13:33	13.31	7.30	--	NP	6.01	--
MW-520	03/21/11	12:18	13.31	5.38	--	NP	7.93	--
MW-520	06/14/11	10:01	13.31	7.59	--	NP	5.72	--
MW-520	09/26/11	10:43	13.31	7.82	--	NP	5.49	--
MW-520	12/12/11	11:40	13.31	7.85	--	NP	5.46	--
MW-520	03/27/12	13:47	13.31	6.84	--	NP	6.47	--
MW-520	06/27/12	16:40	13.31	7.53	--	NP	5.78	--
MW-520	09/25/12	7:22	13.31	7.94	--	NP	5.37	--
MW-520	12/13/12	9:53	13.31	6.71	--	NP	6.60	--
MW-520	03/25/13	10:00	13.31	7.70	--	NP	5.61	--
MW-520	06/24/13	11:22	13.31	7.59	--	NP	5.72	--
MW-520	09/23/13	13:28	13.31	7.52	--	NP	5.79	--
MW-520	12/16/13	9:47	13.31	8.04	--	NP	5.27	--
MW-520	03/26/14	7:50	13.31	7.31	--	NP	6.00	--
MW-520	06/16/14	13:17	13.31	7.62	--	NP	5.69	--
MW-520	09/29/14	15:00	13.31	7.39	--	NP	5.92	--
MW-520	12/08/14	11:40	13.31	6.69	--	NP	6.62	--
MW-520	03/23/15	13:11	13.31	7.00	--	NP	6.31	--
MW-520	06/22/15	15:17	13.31	7.80	--	NP	5.51	--
MW-520	10/27/16	8:56	13.31	6.48	--	NP	6.83	--
MW-520	07/24/17	11:34	13.31	7.71	--	NP	5.60	--
MW-520	03/19/18	12:17	13.31	7.42	--	NP	5.89	--
MW-520	06/26/18	9:57	13.31	7.96	--	NP	5.35	--
MW-520	09/21/18	8:41	13.31	7.88	--	NP	5.43	--
MW-520	11/26/18	12:40	13.31	7.31	--	NP	6.00	--



**Table 3-3**  
**Groundwater Elevation Data**  
**Former Unocal Edmonds Bulk Fuel Terminal**  
**11720 Unoco Road**  
**Edmonds, Washington**

Monitoring Well	Date	Time	Top of Casing Elevation (feet)	Depth to Water (top of casing) (feet)	Depth to LNAPL (feet)	LNAPL Thickness (feet)	Groundwater Elevation (feet amsl)	Comment
MW-521	10/20/08	15:48	12.18	6.82	--	NP	5.36	--
MW-521	12/08/08	10:21	12.18	6.71	--	NP	5.47	--
MW-521	02/20/09	9:21	12.18	6.49	--	NP	5.69	--
MW-521	04/20/09	9:04	12.18	6.75	--	NP	5.43	--
MW-521	06/22/09	11:06	12.18	6.41	--	NP	5.77	--
MW-521	08/03/09	10:55	12.18	6.57	--	NP	5.61	--
MW-521	08/17/09	8:48	12.18	6.80	--	NP	5.38	--
MW-521	10/29/09	8:56	12.18	6.33	--	NP	5.85	--
MW-521	01/18/10	13:24	12.18	4.39	--	NP	7.79	--
MW-521	04/19/10	14:33	12.18	6.01	--	NP	6.17	--
MW-521	07/19/10	7:01	12.18	6.74	--	NP	5.44	--
MW-521	10/25/10	13:30	12.18	6.40	--	NP	5.78	--
MW-521	03/21/11	12:16	12.18	5.29	--	NP	6.89	--
MW-521	06/14/11	10:04	12.18	7.45	--	NP	4.73	--
MW-521	09/26/11	10:40	12.18	6.70	--	NP	5.48	--
MW-521	12/12/11	11:38	12.18	6.73	--	NP	5.45	--
MW-521	03/27/12	13:44	12.18	5.75	--	NP	6.43	--
MW-521	06/27/12	16:38	12.18	6.42	--	NP	5.76	--
MW-521	09/25/12	7:35	12.18	6.82	--	NP	5.36	--
MW-521	12/13/12	9:51	12.18	5.60	--	NP	6.58	--
MW-521	03/25/13	9:58	12.18	6.60	--	NP	5.58	--
MW-521	06/24/13	11:26	12.18	6.48	--	NP	5.70	--
MW-521	09/23/13	13:25	12.18	6.41	--	NP	5.77	--
MW-521	12/16/13	9:49	12.18	6.42	--	NP	5.76	--
MW-521	03/26/14	7:52	12.18	6.21	--	NP	5.97	--
MW-521	06/16/14	13:15	12.18	6.50	--	NP	5.68	--
MW-521	09/29/14	14:59	12.18	6.27	--	NP	5.91	--
MW-521	12/08/14	11:32	12.18	5.61	--	NP	6.57	--
MW-521	03/23/15	13:10	12.18	5.90	--	NP	6.28	--
MW-521	06/22/15	15:15	12.18	6.69	--	NP	5.49	--
MW-521	10/27/16	--	12.18	--	--	--	--	--
MW-521	07/24/17	11:36	12.18	6.67	--	NP	5.51	--
MW-521	03/19/18	12:19	12.18	6.33	--	NP	5.85	--
MW-521	06/26/18	9:55	12.18	6.89	--	NP	5.29	--
MW-521	09/21/18	8:44	12.18	6.76	--	NP	5.42	--
MW-521	11/26/18	12:41	12.18	6.21	--	NP	5.97	--
MW-522	10/20/08	15:50	13.82	8.49	--	NP	5.33	--
MW-522	12/08/08	10:19	13.82	8.35	--	NP	5.47	--
MW-522	02/20/09	9:23	13.82	8.10	--	NP	5.72	--
MW-522	04/20/09	9:07	13.82	8.41	--	NP	5.41	--
MW-522	06/22/09	11:15	13.82	8.11	--	NP	5.71	--
MW-522	08/03/09	10:53	13.82	8.25	--	NP	5.57	--
MW-522	08/17/09	8:54	13.82	8.51	--	NP	5.31	--
MW-522	10/29/09	8:56	13.82	7.99	--	NP	5.83	--
MW-522	01/18/10	13:22	13.82	6.03	--	NP	7.79	--
MW-522	04/19/10	14:31	13.82	7.65	--	NP	6.17	--
MW-522	07/19/10	7:02	13.82	8.43	--	NP	5.39	--
MW-522	10/25/10	13:33	13.82	7.80	--	NP	6.02	--
MW-522	03/21/11	12:18	13.82	6.97	--	NP	6.85	--
MW-522	06/14/11	9:59	13.82	8.13	--	NP	5.69	--
MW-522	09/26/11	10:46	13.82	8.40	--	NP	5.42	--
MW-522	12/12/11	11:42	13.82	8.38	--	NP	5.44	--
MW-522	03/27/12	13:49	13.82	7.42	--	NP	6.40	--
MW-522	06/27/12	16:39	13.82	8.08	--	NP	5.74	--
MW-522	09/25/12	7:32	13.82	8.48	--	NP	5.34	--
MW-522	12/13/12	9:50	13.82	7.22	--	NP	6.60	--
MW-522	03/25/13	10:00	13.82	8.25	--	NP	5.57	--
MW-522	06/24/13	11:20	13.82	8.17	--	NP	5.65	--
MW-522	09/23/13	13:30	13.82	8.04	--	NP	5.78	--
MW-522	12/16/13	9:43	13.82	8.58	--	NP	5.24	--
MW-522	03/26/14	7:46	13.82	7.84	--	NP	5.98	--
MW-522	06/16/14	13:18	13.82	8.19	--	NP	5.63	--
MW-522	09/29/14	13:27	13.82	7.90	--	NP	5.92	--
MW-522	12/08/14	12:11	13.82	7.19	--	NP	6.63	--
MW-522	03/23/15	13:08	13.82	7.55	--	NP	6.27	--
MW-522	06/22/15	15:12	13.82	8.34	--	NP	5.48	--
MW-522	10/27/16	8:55	13.82	6.99	--	NP	6.83	--
MW-522	07/24/17	11:32	13.82	5.36	--	NP	8.46	--
MW-522	03/19/18	12:15	13.82	8.01	--	NP	5.81	--
MW-522	06/26/18	9:52	13.82	8.58	--	NP	5.24	--
MW-522	09/21/18	8:39	13.82	8.43	--	NP	5.39	--
MW-522	11/26/18	12:38	13.82	7.83	--	NP	5.99	--
MW-523	10/20/08	15:47	13.53	8.17	--	NP	5.36	--

**Table 3-3**  
**Groundwater Elevation Data**  
**Former Unocal Edmonds Bulk Fuel Terminal**  
**11720 Unoco Road**  
**Edmonds, Washington**

Monitoring Well	Date	Time	Top of Casing Elevation (feet)	Depth to Water (top of casing) (feet)	Depth to LNAPL (feet)	LNAPL Thickness (feet)	Groundwater Elevation (feet amsl)	Comment
MW-523	12/08/08	10:15	13.53	8.05	--	NP	5.48	--
MW-523	02/20/09	9:21	13.53	7.81	--	NP	5.72	--
MW-523	04/20/09	9:10	13.53	8.10	--	NP	5.43	--
MW-523	06/22/09	11:11	13.53	7.78	--	NP	5.75	--
MW-523	08/03/09	10:52	13.53	7.91	--	NP	5.62	--
MW-523	08/17/09	8:52	13.53	8.17	--	NP	5.36	--
MW-523	10/29/09	8:54	13.53	7.69	--	NP	5.84	--
MW-523	01/18/10	13:20	13.53	5.73	--	NP	7.80	--
MW-523	04/19/10	14:27	13.53	7.35	--	NP	6.18	--
MW-523	07/19/10	6:54	13.53	8.09	--	NP	5.44	--
MW-523	10/25/10	13:30	13.53	7.52	--	NP	6.01	--
MW-523	03/21/11	12:15	13.53	6.64	--	NP	6.89	--
MW-523	06/14/11	9:58	13.53	7.85	--	NP	5.68	--
MW-523	09/26/11	10:44	13.53	8.02	--	NP	5.51	--
MW-523	12/12/11	11:37	13.53	8.09	--	NP	5.44	--
MW-523	03/27/12	13:45	13.53	7.09	--	NP	6.44	--
MW-523	06/27/12	16:35	13.53	7.77	--	NP	5.76	--
MW-523	09/25/12	7:27	13.53	8.20	--	NP	5.33	--
MW-523	12/13/12	9:48	13.53	6.95	--	NP	6.58	--
MW-523	03/25/13	9:55	13.53	7.95	--	NP	5.58	--
MW-523	06/24/13	11:18	13.53	7.84	--	NP	5.69	--
MW-523	09/23/13	13:25	13.53	7.75	--	NP	5.78	--
MW-523	12/16/13	9:40	13.53	8.27	--	NP	5.26	--
MW-523	03/26/14	7:44	13.53	7.55	--	NP	5.98	--
MW-523	06/16/14	13:14	13.53	7.89	--	NP	5.64	--
MW-523	09/29/14	13:25	13.53	7.61	--	NP	5.92	--
MW-523	12/08/14	11:55	13.53	6.91	--	NP	6.62	--
MW-523	03/23/15	13:05	13.53	7.22	--	NP	6.31	--
MW-523	06/22/15	15:10	13.53	8.04	--	NP	5.49	--
MW-523	10/27/16	8:47	13.53	6.71	--	NP	6.82	--
MW-523	07/24/17	11:29	13.53	7.96	--	NP	5.57	--
MW-523	03/19/18	12:12	13.53	7.68	--	NP	5.85	--
MW-523	06/26/18	9:47	13.53	8.26	--	NP	5.27	--
MW-523	09/21/18	8:34	13.53	8.13	--	NP	5.40	--
MW-523	11/26/18	12:35	13.53	7.57	--	NP	5.96	--
MW-524	10/20/08	15:44	13.16	8.95	--	NP	4.21	--
MW-524	12/08/08	10:09	13.16	7.71	--	NP	5.45	--
MW-524	02/20/09	9:13	13.16	7.60	--	NP	5.56	--
MW-524	04/20/09	9:08	13.16	7.81	--	NP	5.35	--
MW-524	06/22/09	11:19	13.16	7.69	--	NP	5.47	--
MW-524	08/03/09	10:47	13.16	7.79	--	NP	5.37	--
MW-524	08/17/09	7:33	13.16	8.03	--	NP	5.13	--
MW-524	10/29/09	8:50	13.16	6.75	--	NP	6.41	--
MW-524	01/18/10	13:17	13.16	4.26	--	NP	8.90	--
MW-524	04/19/10	14:23	13.16	7.17	--	NP	5.99	--
MW-524	07/19/10	6:51	13.16	7.99	--	NP	5.17	--
MW-524	10/25/10	13:27	13.16	6.97	--	NP	6.19	--
MW-524	03/21/11	12:12	13.16	5.78	--	NP	7.38	--
MW-524	06/14/11	9:48	13.16	7.67	--	NP	5.49	--
MW-524	09/26/11	10:41	13.16	7.90	--	NP	5.26	--
MW-524	12/12/11	11:33	13.16	7.74	--	NP	5.42	--
MW-524	03/27/12	13:41	13.16	6.60	--	NP	6.56	--
MW-524	06/27/12	16:32	13.16	7.49	--	NP	5.67	--
MW-524	09/25/12	7:18	13.16	8.05	--	NP	5.11	--
MW-524	12/13/12	9:44	13.16	6.20	--	NP	6.96	--
MW-524	03/25/13	11:28	13.16	7.68	--	NP	5.48	--
MW-524	06/24/13	11:19	13.16	7.75	--	NP	5.41	--
MW-524	09/23/13	13:20	13.16	7.55	--	NP	5.61	--
MW-524	12/16/13	9:41	13.16	8.02	--	NP	5.14	--
MW-524	03/26/14	7:39	13.16	6.98	--	NP	6.18	--
MW-524	06/16/14	13:10	13.16	7.79	--	NP	5.37	--
MW-524	09/29/14	13:20	13.16	7.36	--	NP	5.80	--
MW-524	12/08/14	11:53	13.16	6.56	--	NP	6.6	--
MW-524	03/23/15	13:02	13.16	6.85	--	NP	6.31	--
MW-524	06/22/15	15:04	13.16	7.89	--	NP	5.27	--
MW-524	10/27/16	8:45	13.16	5.49	--	NP	7.67	--
MW-524	07/24/17	11:25	13.16	7.78	--	NP	5.38	--
MW-524	03/19/18	12:10	13.16	7.30	--	NP	5.86	--
MW-524	06/26/18	9:45	13.16	7.95	--	NP	5.21	--
MW-524	09/21/18	8:28	13.16	7.94	--	NP	5.22	--
MW-524	11/26/18	12:28	13.16	7.19	--	NP	5.97	--
MW-525	06/27/12	16:50	12.62	6.02	--	NP	6.60	--
MW-525	09/25/12	7:27	12.62	6.57	--	NP	6.05	--

**Table 3-3**  
**Groundwater Elevation Data**  
**Former Unocal Edmonds Bulk Fuel Terminal**  
**11720 Unoco Road**  
**Edmonds, Washington**

Monitoring Well	Date	Time	Top of Casing Elevation (feet)	Depth to Water (top of casing) (feet)	Depth to LNAPL (feet)	LNAPL Thickness (feet)	Groundwater Elevation (feet amsl)	Comment
MW-525	12/13/12	10:05	12.62	5.40	--	NP	7.22	--
MW-525	03/25/13	10:04	12.62	6.01	--	NP	6.61	--
MW-525	06/24/13	12:54	12.62	6.30	--	NP	6.32	--
MW-525	09/23/13	13:20	12.62	6.18	--	NP	6.44	--
MW-525	12/16/13	9:58	12.62	6.45	--	NP	6.17	--
MW-525	03/26/14	8:02	12.62	5.58	--	NP	7.04	--
MW-525	06/16/14	14:50	12.62	6.30	--	<0.01	6.32	Film observed during gauging
MW-525	09/29/14	14:35	12.62	6.08	--	<0.01	6.54	Film observed during gauging
MW-525	12/08/14	11:42	12.62	5.45	--	NP	7.17	--
MW-525	03/23/15	16:00	12.62	5.75	--	NP	6.87	Sheen
MW-525	06/22/15	15:32	12.62	6.36	6.35	0.01	6.27	See **
MW-525	10/27/16	9:00	12.62	5.49	--	NP	7.13	--
MW-525	07/24/17	13:06	12.62	6.65	--	NP	5.97	--
MW-525	03/19/18	12:25	12.62	6.37	--	NP	6.25	--
MW-525	06/26/18	10:02	12.62	6.84	--	NP	5.78	--
MW-525	09/21/18	8:14	12.62	6.66	--	NP	5.96	--
MW-525	11/26/18	12:17	12.62	6.15	--	NP	6.47	--
MW-526	06/27/12	17:03	12.90	4.93	--	NP	7.97	--
MW-526	09/25/12	8:25	12.90	5.54	--	NP	7.36	--
MW-526	12/13/12	10:17	12.90	4.26	--	NP	8.64	--
MW-526	03/25/13	10:23	12.90	4.71	--	NP	8.19	--
MW-526	06/24/13	11:35	12.90	5.27	--	NP	7.63	--
MW-526	09/23/13	13:43	12.90	5.29	--	NP	7.61	--
MW-526	12/16/13	10:09	12.90	5.29	--	NP	7.61	--
MW-526	03/26/14	8:11	12.90	4.38	--	NP	8.52	--
MW-526	06/16/14	13:33	12.90	5.14	--	NP	7.76	--
MW-526	09/29/14	15:18	12.90	5.33	--	NP	7.57	--
MW-526	12/08/14	11:52	12.90	4.55	--	NP	8.35	--
MW-526	03/23/15	13:30	12.90	4.56	--	NP	8.34	--
MW-526	06/22/15	15:40	12.90	5.31	--	NP	7.59	--
MW-526	10/27/16	9:10	12.90	5.01	--	NP	7.89	--
MW-526	07/24/17	11:03	12.90	5.49	--	NP	7.41	--
MW-526	03/19/18	12:52	12.90	5.45	--	NP	7.45	--
MW-526	06/26/18	11:00	12.90	6.12	--	NP	6.78	--
MW-526	09/21/18	9:36	12.90	5.96	--	NP	6.94	--
MW-526	11/26/18	12:55	12.90	5.80	--	NP	7.10	--
MW-526	02/07/19	11:27	12.90	5.40	--	NP	7.50	Not part of the quarterly monitoring program; gauged out of low tide window
MW-527	06/27/12	17:50	19.09	9.41	--	NP	9.68	--
MW-527	09/25/12	8:10	19.09	10.41	--	NP	8.68	--
MW-527	12/13/12	10:30	19.09	7.22	--	NP	11.87	--
MW-527	03/25/13	10:42	19.09	9.05	--	NP	10.04	--
MW-527	06/24/13	12:31	19.09	9.91	--	NP	9.18	--
MW-527	09/23/13	13:48	19.09	9.95	--	NP	9.14	--
MW-527	12/16/13	10:59	19.09	9.50	--	NP	9.59	--
MW-527	03/26/14	9:00	19.09	7.58	--	NP	11.51	--
MW-527	06/16/14	13:38	19.09	9.88	--	NP	9.21	--
MW-527	09/29/14	15:30	19.09	10.05	--	NP	9.04	--
MW-527	12/08/14	13:05	19.09	8.65	--	NP	10.44	--
MW-527	03/23/15	14:20	19.09	8.82	--	NP	10.27	--
MW-527	06/22/15	14:48	19.09	10.18	--	NP	8.91	--
MW-527	10/27/16	9:45	19.09	6.79	--	NP	12.30	--
MW-527	07/24/17	11:56	19.09	9.90	--	NP	9.19	--
MW-527	03/19/18	12:56	19.09	8.97	--	NP	10.12	--
MW-527	06/26/18	9:50	19.09	9.75	--	NP	9.34	--
MW-527	09/21/18	9:09	19.09	9.91	--	NP	9.18	--
MW-527	11/26/18	12:35	19.09	9.10	--	NP	9.99	--
MW-528	06/27/12	17:47	19.74	9.46	--	NP	10.28	--
MW-528	09/25/12	8:07	19.74	10.82	--	NP	8.92	--
MW-528	12/13/12	10:28	19.74	8.12	--	NP	11.62	--
MW-528	03/25/13	10:37	19.74	8.92	--	NP	10.82	--
MW-528	06/24/13	12:30	19.74	10.22	--	NP	9.52	--
MW-528	09/23/13	13:50	19.74	10.27	--	NP	9.47	--
MW-528	12/16/13	10:51	19.74	9.73	--	NP	10.01	--
MW-528	03/26/14	8:59	19.74	8.05	--	NP	11.69	--
MW-528	06/16/14	13:35	19.74	10.03	--	NP	9.71	--
MW-528	09/29/14	15:25	19.74	11.28	--	NP	8.46	--
MW-528	12/08/14	13:10	19.74	8.61	--	NP	11.13	--
MW-528	03/23/15	14:22	19.74	8.53	--	NP	11.21	--
MW-528	06/22/15	14:48	19.74	10.38	--	NP	9.36	--
MW-528	10/27/16	9:36	19.74	8.06	--	NP	11.68	--
MW-528	07/24/17	11:54	19.74	10.59	--	NP	9.15	--
MW-528	03/19/18	12:52	19.74	9.38	--	NP	10.36	--
MW-528	06/26/18	9:44	19.74	10.62	--	NP	9.12	--

**Table 3-3**  
**Groundwater Elevation Data**  
**Former Unocal Edmonds Bulk Fuel Terminal**  
**11720 Unoco Road**  
**Edmonds, Washington**

Monitoring Well	Date	Time	Top of Casing Elevation (feet)	Depth to Water (top of casing) (feet)	Depth to LNAPL (feet)	LNAPL Thickness (feet)	Groundwater Elevation (feet amsl)	Comment
MW-528	09/21/18	9:11	19.74	11.00	--	NP	8.74	--
MW-528	11/26/18	12:36	19.74	10.01	--	NP	9.73	--
MW-529	06/27/12	17:31	10.12	4.39	--	NP	5.73	--
MW-529	09/25/12	7:41	10.12	4.86	--	NP	5.26	--
MW-529	12/13/12	10:21	10.12	3.52	--	NP	6.60	--
MW-529	03/25/13	10:16	10.12	4.33	--	NP	5.79	--
MW-529	06/24/13	12:06	10.12	4.30	--	NP	5.82	--
MW-529	09/23/13	14:30	10.12	4.15	--	NP	5.97	--
MW-529	12/16/13	11:28	10.12	4.64	--	NP	5.48	--
MW-529	03/26/14	8:32	10.12	3.70	--	NP	6.42	--
MW-529	06/16/14	14:43	10.12	4.53	--	NP	5.59	--
MW-529	09/29/14	15:59	10.12	4.07	--	NP	6.05	--
MW-529	12/08/14	13:16	10.12	3.52	--	NP	6.60	--
MW-529	03/23/15	14:36	10.12	4.13	--	NP	5.99	--
MW-529	06/22/15	15:43	10.12	4.75	--	NP	5.37	--
MW-529	10/27/16	9:23	10.12	3.64	--	NP	6.48	--
MW-529 <sup>DB2</sup>	07/24/17	12:15	10.12	4.29	--	NP	5.83	--
MW-530	06/27/12	17:16	11.02	5.27	--	NP	5.75	--
MW-530	09/25/12	7:43	11.02	5.79	--	NP	5.23	--
MW-530	12/13/12	10:13	11.02	4.65	--	NP	6.37	--
MW-530	03/25/13	10:22	11.02	5.06	--	NP	5.96	--
MW-530	06/24/13	12:43	11.02	5.28	--	NP	5.74	--
MW-530	09/23/13	13:57	11.02	5.09	--	NP	5.93	--
MW-530	12/16/13	11:34	11.02	5.21	--	NP	5.81	--
MW-530	03/26/14	8:10	11.02	4.82	--	NP	6.20	--
MW-530	06/16/14	13:13	11.02	5.31	--	NP	5.71	--
MW-530	09/29/14	14:55	11.02	4.90	--	NP	6.12	--
MW-530	12/08/14	12:17	11.02	4.64	--	NP	6.38	--
MW-530	03/23/15	14:37	11.02	5.24	--	NP	5.78	--
MW-530	06/22/15	15:46	11.02	5.65	--	NP	5.37	--
MW-530	10/27/16	9:30	11.02	4.95	--	NP	6.07	--
MW-530	07/24/17	11:30	11.02	4.97	--	NP	6.05	--
MW-530	03/19/18	13:31	11.02	4.93	--	NP	6.09	--
MW-530	06/26/18	10:04	11.02	5.38	--	NP	5.64	--
MW-530	09/21/18	8:40	11.02	5.33	--	NP	5.69	--
MW-530	11/26/18	13:12	11.02	4.20	--	NP	6.82	--
MW-531	06/27/12	16:51	13.26	7.50	--	NP	5.76	--
MW-531	09/25/12	7:24	13.26	7.90	--	NP	5.36	--
MW-531	12/13/12	9:58	13.26	6.70	--	NP	6.56	--
MW-531	03/25/13	10:03	13.26	7.67	--	NP	5.59	--
MW-531	06/24/13	11:30	13.26	7.54	--	NP	5.72	--
MW-531	09/23/13	13:25	13.26	7.43	--	NP	5.83	--
MW-531	12/16/13	10:01	13.26	8.00	--	NP	5.26	--
MW-531	03/26/14	7:56	13.26	7.28	--	NP	5.98	--
MW-531	06/16/14	13:27	13.26	7.59	--	NP	5.67	--
MW-531	09/29/14	15:07	13.26	7.35	--	NP	5.91	--
MW-531	12/08/14	11:42	13.26	6.64	--	NP	6.62	--
MW-531	03/23/15	13:27	13.26	6.95	--	NP	6.31	--
MW-531	06/22/15	15:25	13.26	7.75	--	NP	5.51	--
MW-531	10/27/16	9:00	13.26	6.42	--	NP	6.84	--
MW-531	07/24/17	11:45	13.26	7.69	--	NP	5.57	--
MW-531	03/19/18	12:22	13.26	7.35	--	NP	5.91	--
MW-531	06/26/18	10:05	13.26	7.93	--	NP	5.33	--
MW-531	09/21/18	8:53	13.26	7.81	--	NP	5.45	--
MW-531	11/26/18	12:50	13.26	7.25	--	NP	6.01	--
MW-532	06/27/12	16:48	13.38	6.62	--	NP	6.76	--
MW-532	09/25/12	7:26	13.38	7.11	--	NP	6.27	--
MW-532	12/13/12	9:57	13.38	6.00	--	NP	7.38	--
MW-532	03/25/13	10:05	13.38	6.61	--	NP	6.77	--
MW-532	06/24/13	11:28	13.38	6.79	--	NP	6.59	--
MW-532	09/23/13	13:28	13.38	6.80	--	NP	6.58	--
MW-532	12/16/13	9:56	13.38	7.02	--	NP	6.36	--
MW-532	03/26/14	7:59	13.38	6.31	--	NP	7.07	--
MW-532	06/16/14	13:24	13.38	6.78	--	NP	6.60	--
MW-532	09/29/14	15:11	13.38	6.70	--	NP	6.68	--
MW-532	12/08/14	11:45	13.38	6.14	--	NP	7.24	--
MW-532	03/23/15	13:25	13.38	6.28	--	NP	7.10	--
MW-532	06/22/15	15:23	13.38	7.00	--	NP	6.38	--
MW-532	10/27/16	8:54	13.38	6.52	--	NP	6.86	--
MW-532	07/24/17	11:13	13.38	7.49	--	NP	5.89	--
MW-532	03/19/18	12:25	13.38	7.33	--	NP	6.05	--
MW-532	06/26/18	10:06	13.38	7.75	--	NP	5.63	--
MW-532	09/21/18	8:55	13.38	7.71	--	NP	5.67	--

**Table 3-3**  
**Groundwater Elevation Data**  
**Former Unocal Edmonds Bulk Fuel Terminal**  
**11720 Unoco Road**  
**Edmonds, Washington**

Monitoring Well	Date	Time	Top of Casing Elevation (feet)	Depth to Water (top of casing) (feet)	Depth to LNAPL (feet)	LNAPL Thickness (feet)	Groundwater Elevation (feet amsl)	Comment
MW-532	11/26/18	12:47	13.38	6.97	--	NP	6.41	--
MW-533	03/19/18	12:36	11.79	5.10	--	NP	6.69	--
MW-533	06/26/18	9:46	11.79	5.58	--	NP	6.21	--
MW-533	09/21/18	8:27	11.79	5.49	--	NP	6.30	--
MW-533	11/26/18	12:21	11.79	4.60	--	NP	7.19	--
MW-534	03/19/18	12:37	10.28	3.63	--	NP	6.65	--
MW-534	06/26/18	9:41	10.28	4.00	--	NP	6.28	--
MW-534	09/21/18	8:24	10.28	3.94	--	NP	6.34	--
MW-534	11/26/18	12:23	10.28	3.30	--	NP	6.98	--
MW-535	03/19/18	12:40	11.55	4.90	--	NP	6.65	--
MW-535	06/26/18	9:48	11.55	5.36	--	NP	6.19	--
MW-535	09/21/18	8:26	11.55	5.33	--	NP	6.22	--
MW-535	11/26/18	12:22	11.55	4.18	--	NP	7.37	--
<b>Piezometers</b>								
P-1 <sup>S</sup>	08/03/09	10:23	16.47	7.80	--	NP	8.67	--
P-1 <sup>S</sup>	08/17/09	9:43	16.47	6.60	--	NP	9.87	--
P-1 <sup>S</sup>	10/29/09	9:32	16.47	4.37	--	NP	12.10	--
P-1 <sup>S</sup>	01/18/10	13:31	16.47	1.26	--	NP	15.21	--
P-1 <sup>S</sup>	04/19/10	15:46	16.47	3.21	--	NP	13.26	--
P-1 <sup>S</sup>	07/19/10	8:02	16.47	4.65	--	NP	11.82	--
P-1 <sup>S</sup>	10/25/10	14:26	16.47	4.61	--	NP	11.86	--
P-1 <sup>S</sup>	03/21/11	12:46	16.47	2.16	--	NP	14.31	--
P-1 <sup>S</sup>	06/14/11	11:08	16.47	3.98	--	NP	12.49	--
P-1 <sup>S</sup>	09/26/11	11:27	16.47	6.76	--	NP	9.71	--
P-1 <sup>S</sup>	12/12/11	12:49	16.47	3.87	--	NP	12.60	--
P-1 <sup>S</sup>	03/27/12	14:30	16.47	2.55	--	NP	13.92	--
P-1 <sup>S</sup>	06/27/12	17:43	16.47	3.64	--	NP	12.83	--
P-1 <sup>S</sup>	09/25/12	8:35	16.47	6.45	--	NP	10.02	--
P-1 <sup>S</sup>	12/13/12	10:24	16.47	1.95	--	NP	14.52	--
P-1 <sup>S</sup>	03/25/13	10:45	16.47	2.78	--	NP	13.69	--
P-1 <sup>S</sup>	06/24/13	12:10	16.47	4.84	--	NP	11.63	--
P-1 <sup>S</sup>	09/23/13	14:07	16.47	6.02	--	NP	10.45	--
P-1 <sup>S</sup>	12/16/13	10:41	16.47	4.23	--	NP	12.24	--
P-1 <sup>S</sup>	03/26/14	8:36	16.47	2.42	--	NP	14.05	--
P-1 <sup>S</sup>	06/16/14	13:55	16.47	4.60	--	NP	11.87	--
P-1 <sup>S</sup>	09/29/14	15:57	16.47	7.02	--	NP	9.45	--
P-1 <sup>S</sup>	12/08/14	12:56	16.47	2.81	--	NP	13.66	--
P-1 <sup>S</sup>	03/23/15	14:26	16.47	2.93	--	NP	13.54	--
P-1 <sup>S</sup>	06/22/15	15:06	16.47	5.23	--	NP	11.24	--
P-1 <sup>S</sup>	10/27/16	9:55	16.47	2.06	--	NP	14.41	--
P-1 <sup>S</sup>	07/24/17	--	--	--	--	--	--	Not part of the monitoring network
P-1 <sup>S</sup>	03/19/18	--	--	--	--	--	--	Not part of the monitoring network
P-1 <sup>S</sup>	06/26/18	11:05	16.47	5.23	--	NP	11.24	Not part of the monitoring network
P-2 <sup>D</sup>	08/03/09	10:21	15.00	7.39	--	NP	7.61	--
P-2 <sup>D</sup>	08/17/09	9:46	15.00	7.46	--	NP	7.54	--
P-2 <sup>D</sup>	10/29/09	8:57	15.00	6.38	--	NP	8.62	--
P-2 <sup>D</sup>	01/18/10	13:28	15.00	6.30	--	NP	8.70	--
P-2 <sup>D</sup>	04/19/10	15:47	15.00	6.68	--	NP	8.32	--
P-2 <sup>D</sup>	07/19/10	7:46	15.00	7.02	--	NP	7.98	--
P-2 <sup>D</sup>	10/25/10	14:29	15.00	6.65	--	NP	8.35	--
P-2 <sup>D</sup>	03/21/11	12:49	15.00	6.26	--	NP	8.74	--
P-2 <sup>D</sup>	06/14/11	11:10	15.00	7.01	--	NP	7.99	--
P-2 <sup>D</sup>	09/26/11	11:15	15.00	7.01	--	NP	7.99	--
P-2 <sup>D</sup>	12/12/11	12:52	15.00	6.79	--	NP	8.21	--
P-2 <sup>D</sup>	03/27/12	14:31	15.00	6.35	--	NP	8.65	--
P-2 <sup>D</sup>	06/27/12	17:48	15.00	6.63	--	NP	8.37	--
P-2 <sup>D</sup>	09/25/12	8:12	15.00	7.14	--	NP	7.86	--
P-2 <sup>D</sup>	12/13/12	10:26	15.00	6.19	--	NP	8.81	--
P-2 <sup>D</sup>	03/25/13	10:49	15.00	6.48	--	NP	8.52	--
P-2 <sup>D</sup>	06/24/13	12:15	15.00	6.81	--	NP	8.19	--
P-2 <sup>D</sup>	09/23/13	14:10	15.00	6.84	--	NP	8.16	--
P-2 <sup>D</sup>	12/16/13	10:48	15.00	6.81	--	NP	8.19	--
P-2 <sup>D</sup>	03/26/14	8:38	15.00	7.32	--	NP	7.68	--
P-2 <sup>D</sup>	06/16/14	13:52	15.00	6.86	--	NP	8.14	--
P-2 <sup>D</sup>	09/29/14	15:45	15.00	6.79	--	NP	8.21	--
P-2 <sup>D</sup>	12/08/14	12:55	15.00	6.31	--	NP	8.69	--
P-2 <sup>D</sup>	03/23/15	14:28	15.00	6.26	--	NP	8.74	--
P-2 <sup>D</sup>	06/22/15	15:03	15.00	7.00	--	NP	8.00	--
P-2 <sup>D</sup>	10/27/16	9:52	15.00	6.25	--	NP	8.75	--
P-2 <sup>D</sup>	07/24/17	--	--	--	--	--	--	Not part of the monitoring network
P-2 <sup>D</sup>	03/19/18	--	--	--	--	--	--	Not part of the monitoring network
P-2 <sup>D</sup>	06/26/18	10:40	15.00	6.90	--	NP	8.1	Not part of the monitoring network
P-3 <sup>S</sup>	08/03/09	10:21	14.84	4.47	--	NP	10.37	--

**Table 3-3**  
**Groundwater Elevation Data**  
**Former Unocal Edmonds Bulk Fuel Terminal**  
**11720 Unoco Road**  
**Edmonds, Washington**

Monitoring Well	Date	Time	Top of Casing Elevation (feet)	Depth to Water (top of casing) (feet)	Depth to LNAPL (feet)	LNAPL Thickness (feet)	Groundwater Elevation (feet amsl)	Comment
P-3 <sup>S</sup>	08/17/09	9:48	14.84	4.77	--	NP	10.07	--
P-3 <sup>S</sup>	10/29/09	8:59	14.84	3.35	--	NP	11.49	--
P-3 <sup>S</sup>	01/18/10	13:25	14.84	0.81	--	NP	14.03	--
P-3 <sup>S</sup>	04/19/10	15:48	14.84	2.36	--	NP	12.48	--
P-3 <sup>S</sup>	07/19/10	7:48	14.84	3.72	--	NP	11.12	--
P-3 <sup>S</sup>	10/25/10	14:31	14.84	4.04	--	NP	10.80	--
P-3 <sup>S</sup>	03/21/11	12:49	14.84	1.19	--	NP	13.65	--
P-3 <sup>S</sup>	06/14/11	11:11	14.84	3.05	--	NP	11.79	--
P-3 <sup>S</sup>	09/26/11	11:17	14.84	5.18	--	NP	9.66	--
P-3 <sup>S</sup>	12/12/11	12:54	14.84	2.95	--	NP	11.89	--
P-3 <sup>S</sup>	03/27/12	14:32	14.84	1.63	--	NP	13.21	--
P-3 <sup>S</sup>	06/27/12	17:54	14.84	3.11	--	NP	11.73	--
P-3 <sup>S</sup>	09/25/12	8:14	14.84	4.80	--	NP	10.04	--
P-3 <sup>S</sup>	12/13/12	10:27	14.84	1.42	--	NP	13.42	--
P-3 <sup>S</sup>	03/25/13	10:51	14.84	2.16	--	NP	12.68	--
P-3 <sup>S</sup>	06/24/13	12:16	14.84	4.02	--	NP	10.82	--
P-3 <sup>S</sup>	09/23/13	14:12	14.84	4.49	--	NP	10.35	--
P-3 <sup>S</sup>	12/16/13	10:47	14.84	3.55	--	NP	11.29	--
P-3 <sup>S</sup>	03/26/14	8:39	14.84	1.48	--	NP	13.36	--
P-3 <sup>S</sup>	06/16/14	13:54	14.84	3.80	--	NP	11.04	--
P-3 <sup>S</sup>	09/29/14	15:43	14.84	4.80	--	NP	10.04	--
P-3 <sup>S</sup>	12/08/14	13:00	14.84	1.90	--	NP	12.94	--
P-3 <sup>S</sup>	03/23/15	14:29	14.84	2.10	--	NP	12.74	--
P-3 <sup>S</sup>	06/22/15	15:01	14.84	4.24	--	NP	10.60	--
P-3 <sup>S</sup>	10/27/16	9:50	14.84	1.15	--	NP	13.69	--
P-3 <sup>S</sup>	07/24/17	--	--	--	--	--	--	Not part of the monitoring network
P-3 <sup>S</sup>	03/19/18	--	--	--	--	--	--	Not part of the monitoring network
P-3 <sup>S</sup>	06/26/18	10:46	14.84	4.14	--	NP	10.7	Not part of the monitoring network
P-4 <sup>D</sup>	08/03/09	10:19	16.38	8.64	--	NP	7.74	--
P-4 <sup>D</sup>	08/17/09	9:49	16.38	8.75	--	NP	7.63	--
P-4 <sup>D</sup>	10/29/09	9:08	16.38	7.64	--	NP	8.74	--
P-4 <sup>D</sup>	01/18/10	13:21	16.38	7.56	--	NP	8.82	--
P-4 <sup>D</sup>	04/19/10	15:49	16.38	7.92	--	NP	8.46	--
P-4 <sup>D</sup>	07/19/10	7:50	16.38	8.28	--	NP	8.10	--
P-4 <sup>D</sup>	10/25/10	14:34	16.38	7.93	--	NP	8.45	--
P-4 <sup>D</sup>	03/21/11	12:52	16.38	7.51	--	NP	8.87	--
P-4 <sup>D</sup>	06/14/11	11:14	16.38	8.23	--	NP	8.15	--
P-4 <sup>D</sup>	09/26/11	11:20	16.38	8.41	--	NP	7.97	--
P-4 <sup>D</sup>	12/12/11	13:01	16.38	8.00	--	NP	8.38	--
P-4 <sup>D</sup>	03/27/12	14:34	16.38	7.60	--	NP	8.78	--
P-4 <sup>D</sup>	06/27/12	17:30	16.38	7.92	--	NP	8.46	--
P-4 <sup>D</sup>	09/25/12	8:19	16.38	8.37	--	NP	8.01	--
P-4 <sup>D</sup>	12/13/12	10:30	16.38	7.45	--	NP	8.93	--
P-4 <sup>D</sup>	03/25/13	10:54	16.38	7.79	--	NP	8.59	--
P-4 <sup>D</sup>	06/24/13	12:22	16.38	8.00	--	NP	8.38	--
P-4 <sup>D</sup>	09/23/13	14:03	16.38	8.11	--	NP	8.27	--
P-4 <sup>D</sup>	12/16/13	10:49	16.38	8.05	--	NP	8.33	--
P-4 <sup>D</sup>	03/26/14	8:47	16.38	7.56	--	NP	8.82	--
P-4 <sup>D</sup>	06/16/14	13:45	16.38	8.01	--	NP	8.37	--
P-4 <sup>D</sup>	09/29/14	15:35	16.38	8.03	--	NP	8.35	--
P-4 <sup>D</sup>	12/08/14	12:58	16.38	7.53	--	NP	8.85	--
P-4 <sup>D</sup>	03/23/15	14:30	16.38	7.82	--	NP	8.56	--
P-4 <sup>D</sup>	06/22/15	14:56	16.38	8.28	--	NP	8.10	--
P-4 <sup>D</sup>	10/27/16	9:48	16.38	7.43	--	NP	8.95	--
P-4 <sup>D</sup>	07/24/17	--	--	--	--	--	--	Not part of the monitoring network
P-4 <sup>D</sup>	03/19/18	--	--	--	--	--	--	Not part of the monitoring network
P-4 <sup>D</sup>	06/26/18	10:28	16.38	8.19	--	NP	8.19	Not part of the monitoring network
P-5 <sup>S</sup>	08/03/09	10:19	16.85	6.47	--	NP	10.38	--
P-5 <sup>S</sup>	08/17/09	9:50	16.85	6.78	--	NP	10.07	--
P-5 <sup>S</sup>	10/29/09	9:10	16.85	5.85	--	NP	11.00	--
P-5 <sup>S</sup>	01/18/10	13:18	16.85	2.76	--	NP	14.09	--
P-5 <sup>S</sup>	04/19/10	15:50	16.85	4.31	--	NP	12.54	--
P-5 <sup>S</sup>	07/19/10	7:54	16.85	5.71	--	NP	11.14	--
P-5 <sup>S</sup>	10/25/10	14:33	16.85	6.03	--	NP	10.82	--
P-5 <sup>S</sup>	03/21/11	12:53	16.85	3.17	--	NP	13.68	--
P-5 <sup>S</sup>	06/14/11	11:15	16.85	5.00	--	NP	11.85	--
P-5 <sup>S</sup>	09/26/11	11:21	16.85	7.13	--	NP	9.72	--
P-5 <sup>S</sup>	12/12/11	13:02	16.85	4.93	--	NP	11.92	--
P-5 <sup>S</sup>	03/27/12	14:35	16.85	3.60	--	NP	13.25	--
P-5 <sup>S</sup>	06/27/12	17:32	16.85	5.07	--	NP	11.78	--
P-5 <sup>S</sup>	09/25/12	8:21	16.85	6.78	--	NP	10.07	--
P-5 <sup>S</sup>	12/13/12	10:32	16.85	3.01	--	NP	13.84	--
P-5 <sup>S</sup>	03/25/13	10:52	16.85	4.00	--	NP	12.85	--

**Table 3-3**  
**Groundwater Elevation Data**  
**Former Unocal Edmonds Bulk Fuel Terminal**  
**11720 Unoco Road**  
**Edmonds, Washington**

Monitoring Well	Date	Time	Top of Casing Elevation (feet)	Depth to Water (top of casing) (feet)	Depth to LNAPL (feet)	LNAPL Thickness (feet)	Groundwater Elevation (feet amsl)	Comment
P-5 <sup>S</sup>	06/24/13	12:23	16.85	5.95	--	NP	10.90	--
P-5 <sup>S</sup>	09/23/13	14:01	16.85	6.46	--	NP	10.39	--
P-5 <sup>S</sup>	12/16/13	10:48	16.85	5.46	--	NP	11.39	--
P-5 <sup>S</sup>	03/26/14	8:48	16.85	3.31	--	NP	13.54	--
P-5 <sup>S</sup>	06/16/14	13:41	16.85	5.68	--	NP	11.17	--
P-5 <sup>S</sup>	09/29/14	15:37	16.85	6.79	--	NP	10.06	--
P-5 <sup>S</sup>	12/08/14	13:02	16.85	3.67	--	NP	13.18	--
P-5 <sup>S</sup>	03/23/15	14:32	16.85	3.88	--	NP	12.97	--
P-5 <sup>S</sup>	06/22/15	15:04	16.85	6.17	--	NP	10.68	--
P-5 <sup>S</sup>	10/27/16	9:46	16.85	3.20	--	NP	13.65	--
P-5 <sup>S</sup>	07/24/17	--	--	--	--	--	--	Not part of the monitoring network
P-5 <sup>S</sup>	03/19/18	--	--	--	--	--	--	Not part of the monitoring network
P-5 <sup>S</sup>	06/26/18	10:38	16.85	6.10	--	NP	10.75	Not part of the monitoring network
P-6 <sup>S</sup>	08/03/09	10:16	17.67	9.90	--	NP	7.77	--
P-6 <sup>S</sup>	08/17/09	9:53	17.67	6.31	--	NP	11.36	--
P-6 <sup>S</sup>	10/29/09	9:12	17.67	4.92	--	NP	12.75	--
P-6 <sup>S</sup>	01/18/10	13:10	17.67	3.09	--	NP	14.58	--
P-6 <sup>S</sup>	04/19/10	15:52	17.67	4.63	--	NP	13.04	--
P-6 <sup>S</sup>	07/19/10	7:59	17.67	5.21	--	NP	12.46	--
P-6 <sup>S</sup>	10/25/10	14:29	17.67	4.81	--	NP	12.86	--
P-6 <sup>S</sup>	03/21/11	12:54	17.67	3.41	--	NP	14.26	--
P-6 <sup>S</sup>	06/14/11	11:20	17.67	5.05	--	NP	12.62	--
P-6 <sup>S</sup>	09/26/11	11:25	17.67	6.40	--	NP	11.27	--
P-6 <sup>S</sup>	12/12/11	13:05	17.67	5.07	--	NP	12.60	--
P-6 <sup>S</sup>	03/27/12	14:39	17.67	3.90	--	NP	13.77	--
P-6 <sup>S</sup>	06/27/12	17:39	17.67	4.64	--	NP	13.03	--
P-6 <sup>S</sup>	09/25/12	8:17	17.67	5.94	--	NP	11.73	--
P-6 <sup>S</sup>	12/13/12	10:35	17.67	3.71	--	NP	13.96	--
P-6 <sup>S</sup>	03/25/13	10:45	17.67	4.60	--	NP	13.07	--
P-6 <sup>S</sup>	06/24/13	12:24	17.67	5.22	--	NP	12.45	--
P-6 <sup>S</sup>	09/23/13	13:58	17.67	5.23	--	NP	12.44	--
P-6 <sup>S</sup>	12/16/13	10:56	17.67	4.91	--	NP	12.76	--
P-6 <sup>S</sup>	03/26/14	8:55	17.67	3.74	--	NP	13.93	--
P-6 <sup>S</sup>	06/16/14	13:50	17.67	5.16	--	NP	12.51	--
P-6 <sup>S</sup>	09/29/14	15:59	17.67	6.77	--	NP	10.90	--
P-6 <sup>S</sup>	12/08/14	13:09	17.67	4.05	--	NP	13.62	--
P-6 <sup>S</sup>	03/23/15	14:35	17.67	3.97	--	NP	13.70	--
P-6 <sup>S</sup>	06/22/15	14:50	17.67	5.38	--	NP	12.29	--
P-6 <sup>S</sup>	10/27/16	9:42	17.67	3.55	--	NP	14.12	--
P-6 <sup>S</sup>	07/24/17	--	--	--	--	--	--	Not part of the monitoring network
P-6 <sup>S</sup>	03/19/18	--	--	--	--	--	--	Not part of the monitoring network
P-6 <sup>S</sup>	06/26/18	10:37	17.67	5.41	--	NP	12.26	Not part of the monitoring network
P-7 <sup>D</sup>	08/03/09	10:17	17.63	9.72	--	NP	7.91	--
P-7 <sup>D</sup>	08/17/09	9:52	17.63	9.80	--	NP	7.83	--
P-7 <sup>D</sup>	10/29/09	8:55	17.63	6.15	--	NP	11.48	--
P-7 <sup>D</sup>	01/18/10	13:14	17.63	8.56	--	NP	9.07	--
P-7 <sup>D</sup>	04/19/10	15:51	17.63	8.94	--	NP	8.69	--
P-7 <sup>D</sup>	07/19/10	8:00	17.63	7.36	--	NP	10.27	--
P-7 <sup>D</sup>	10/25/10	14:31	17.63	8.97	--	NP	8.66	--
P-7 <sup>D</sup>	03/21/11	12:52	17.63	8.62	--	NP	9.01	--
P-7 <sup>D</sup>	06/14/11	11:18	17.63	9.24	--	NP	8.39	--
P-7 <sup>D</sup>	09/26/11	11:23	17.63	9.55	--	NP	8.08	--
P-7 <sup>D</sup>	12/12/11	13:04	17.63	9.04	--	NP	8.59	--
P-7 <sup>D</sup>	03/27/12	14:36	17.63	8.66	--	NP	8.97	--
P-7 <sup>D</sup>	06/27/12	17:37	17.63	8.94	--	NP	8.69	--
P-7 <sup>D</sup>	09/25/12	8:19	17.63	9.49	--	NP	8.14	--
P-7 <sup>D</sup>	12/13/12	10:37	17.63	8.49	--	NP	9.14	--
P-7 <sup>D</sup>	03/25/13	10:47	17.63	8.81	--	NP	8.82	--
P-7 <sup>D</sup>	06/24/13	12:26	17.63	9.13	--	NP	8.50	--
P-7 <sup>D</sup>	09/23/13	14:00	17.63	9.16	--	NP	8.47	--
P-7 <sup>D</sup>	12/16/13	10:57	17.63	9.11	--	NP	8.52	--
P-7 <sup>D</sup>	03/26/14	8:50	17.63	8.66	--	NP	8.97	--
P-7 <sup>D</sup>	06/16/14	13:49	17.63	9.07	--	NP	8.56	--
P-7 <sup>D</sup>	09/29/14	15:59	17.63	9.12	--	NP	8.51	--
P-7 <sup>D</sup>	12/08/14	13:06	17.63	8.60	--	NP	9.03	--
P-7 <sup>D</sup>	03/23/15	14:34	17.63	8.82	--	NP	8.81	--
P-7 <sup>D</sup>	06/22/15	14:51	17.63	9.29	--	NP	8.34	--
P-7 <sup>D</sup>	10/27/16	9:44	17.63	8.56	--	NP	9.07	--
P-7 <sup>D</sup>	07/24/17	--	--	--	--	--	--	Not part of the monitoring network
P-7 <sup>D</sup>	03/19/18	--	--	--	--	--	--	Not part of the monitoring network
P-7 <sup>D</sup>	06/26/18	10:33	17.63	9.00	--	NP	8.63	Not part of the monitoring network
P-8 <sup>D</sup>	08/03/09	10:24	16.07	8.52	--	NP	7.55	--
P-8 <sup>D</sup>	08/17/09	9:41	16.07	8.92	--	NP	7.15	--

**Table 3-3**  
**Groundwater Elevation Data**  
**Former Unocal Edmonds Bulk Fuel Terminal**  
**11720 Unoco Road**  
**Edmonds, Washington**

Monitoring Well	Date	Time	Top of Casing Elevation (feet)	Depth to Water (top of casing) (feet)	Depth to LNAPL (feet)	LNAPL Thickness (feet)	Groundwater Elevation (feet amsl)	Comment
P-8 <sup>D</sup>	10/29/09	8:53	16.07	8.03	--	NP	8.04	--
P-8 <sup>D</sup>	01/18/10	13:33	16.07	7.47	--	NP	8.60	--
P-8 <sup>D</sup>	04/19/10	15:45	16.07	7.80	--	NP	8.27	--
P-8 <sup>D</sup>	07/19/10	8:03	16.07	8.12	--	NP	7.95	--
P-8 <sup>D</sup>	10/25/10	14:24	16.07	7.80	--	NP	8.27	--
P-8 <sup>D</sup>	03/21/11	12:45	16.07	7.49	--	NP	8.58	--
P-8 <sup>D</sup>	06/14/11	11:05	16.07	8.16	--	NP	7.91	--
P-8 <sup>D</sup>	09/26/11	11:20	16.07	8.34	--	NP	7.73	--
P-8 <sup>D</sup>	12/12/11	12:48	16.07	7.94	--	NP	8.13	--
P-8 <sup>D</sup>	03/27/12	14:29	16.07	7.49	--	NP	8.58	--
P-8 <sup>D</sup>	06/27/12	17:41	16.07	7.78	--	NP	8.29	--
P-8 <sup>D</sup>	09/25/12	8:10	16.07	8.29	--	NP	7.78	--
P-8 <sup>D</sup>	12/13/12	10:21	16.07	7.34	--	NP	8.73	--
P-8 <sup>D</sup>	03/25/13	10:49	16.07	7.60	--	NP	8.47	--
P-8 <sup>D</sup>	06/24/13	12:12	16.07	7.89	--	NP	8.18	--
P-8 <sup>D</sup>	09/23/13	14:05	16.07	8.01	--	NP	8.06	--
P-8 <sup>D</sup>	12/16/13	10:40	16.07	7.93	--	NP	8.14	--
P-8 <sup>D</sup>	03/26/14	8:35	16.07	7.41	--	NP	8.66	--
P-8 <sup>D</sup>	06/16/14	13:53	16.07	7.95	--	NP	8.12	--
P-8 <sup>D</sup>	09/29/14	15:50	16.07	7.94	--	NP	8.13	--
P-8 <sup>D</sup>	12/08/14	12:55	16.07	7.45	--	NP	8.62	--
P-8 <sup>D</sup>	03/23/14	14:33	16.07	7.60	--	NP	8.47	--
P-8 <sup>D</sup>	06/22/15	15:09	16.07	8.18	--	NP	7.89	--
P-8 <sup>D</sup>	10/27/16	9:58	16.07	7.41	--	NP	8.66	--
P-8 <sup>D</sup>	07/24/17	--	--	--	--	--	--	Not part of the monitoring network
P-8 <sup>D</sup>	03/19/18	--	--	--	--	--	--	Not part of the monitoring network
P-8 <sup>D</sup>	06/26/18	10:26	16.07	8.01	--	NP	8.06	Not part of the monitoring network
P-9	08/25/11	12:51	13.86	7.57	--	NP	6.29	--
P-9	09/02/11	10:04	13.86	7.58	--	NP	6.28	--
P-9	09/09/11	7:58	13.86	7.61	--	NP	6.25	--
P-9	09/16/11	14:42	13.86	7.64	--	NP	6.22	--
P-9	09/26/11	11:03	13.86	8.62	--	NP	5.24	--
P-9	10/28/11	9:52	13.86	7.59	--	NP	6.27	--
P-9	11/18/11	8:55	13.86	7.45	--	NP	6.41	--
P-9	12/12/11	13:55	13.86	7.00	--	NP	6.86	--
P-9	03/27/12	14:17	13.86	6.39	--	NP	7.47	--
P-9	06/27/12	17:23	13.86	6.95	--	NP	6.91	--
P-9	09/25/12	7:59	13.86	7.62	--	NP	6.24	--
P-9	12/13/12	10:50	13.86	6.33	--	NP	7.53	--
P-9	03/25/13	11:34	13.86	6.79	--	NP	7.07	--
P-9	06/24/13	12:04	13.86	7.33	--	NP	6.53	--
P-9	09/23/13	14:59	13.86	7.23	--	NP	6.63	--
P-9	12/16/13	10:31	13.86	7.38	--	NP	6.48	--
P-9	03/26/14	9:13	13.86	6.52	--	NP	7.34	--
P-9	06/16/14	13:50	13.86	7.25	--	NP	6.61	--
P-9	09/29/14	15:48	13.86	7.16	--	NP	6.70	--
P-9	12/08/14	12:48	13.86	6.53	--	NP	7.33	--
P-9	03/23/15	14:00	13.86	6.59	--	NP	7.27	--
P-9	06/22/15	15:24	13.86	7.36	--	NP	6.50	--
P-9	10/27/16	9:48	13.86	6.09	--	NP	7.77	--
P-9	07/24/17	--	--	--	--	--	--	Not part of the monitoring network
P-9	03/19/18	--	--	--	--	--	--	Not part of the monitoring network
P-9	06/26/18	--	--	--	--	--	--	Not part of the monitoring network
P-10	08/25/11	12:49	11.07	4.98	--	NP	6.09	--
P-10	09/02/11	10:08	11.07	4.97	--	NP	6.10	--
P-10	09/09/11	8:02	11.07	5.00	--	NP	6.07	--
P-10	09/16/11	14:35	11.07	5.00	--	NP	6.07	--
P-10	09/26/11	10:59	11.07	4.96	--	NP	6.11	--
P-10	10/28/11	9:56	11.07	4.80	--	NP	6.27	--
P-10	11/18/11	9:00	11.07	4.81	--	NP	6.26	--
P-10	12/12/11	12:18	11.07	4.36	--	NP	6.71	--
P-10	03/27/12	14:08	11.07	3.74	--	NP	7.33	--
P-10	06/27/12	17:15	11.07	4.31	--	NP	6.76	--
P-10	09/25/12	7:47	11.07	4.92	--	NP	6.15	--
P-10	12/13/12	10:25	11.07	3.61	--	NP	7.46	--
P-10	03/25/13	11:32	11.07	4.08	--	NP	6.99	--
P-10	06/24/13	12:00	11.07	4.51	--	NP	6.56	--
P-10	09/23/13	13:47	11.07	4.61	--	NP	6.46	--
P-10	12/16/13	10:21	11.07	4.66	--	NP	6.41	--
P-10	03/26/14	8:40	11.07	3.90	--	NP	7.17	--
P-10	06/16/14	13:44	11.07	4.56	--	NP	6.51	--
P-10	09/29/14	13:52	11.07	4.44	--	NP	6.63	--
P-10	12/08/14	12:40	11.07	3.85	--	NP	7.22	--



**Table 3-3**  
**Groundwater Elevation Data**  
**Former Unocal Edmonds Bulk Fuel Terminal**  
**11720 Unoco Road**  
**Edmonds, Washington**

Monitoring Well	Date	Time	Top of Casing Elevation (feet)	Depth to Water (top of casing) (feet)	Depth to LNAPL (feet)	LNAPL Thickness (feet)	Groundwater Elevation (feet amsl)	Comment
P-10	03/23/15	14:21	11.07	3.99	--	NP	7.08	--
P-10	06/22/15	15:28	11.07	4.77	--	NP	6.30	--
P-10	10/27/16	9:46	11.07	2.55	--	NP	8.52	--
P-10 <sup>DB2</sup>	07/24/17	--	--	--	--	--	--	Not part of the monitoring network
P-11	08/25/11	12:45	13.63	7.49	--	NP	6.14	--
P-11	09/02/11	10:10	13.63	7.49	--	NP	6.14	--
P-11	09/09/11	8:05	13.63	7.50	--	NP	6.13	--
P-11	09/16/11	14:30	13.63	7.53	--	NP	6.10	--
P-11	09/26/11	12:15	13.63	7.50	--	NP	6.13	--
P-11	10/28/11	9:59	13.63	7.36	--	NP	6.27	--
P-11	11/18/11	9:03	13.63	7.31	--	NP	6.32	--
P-11	12/12/11	13:58	13.63	6.75	--	NP	6.88	--
P-11	03/27/12	14:03	13.63	6.14	--	NP	7.49	--
P-11	06/27/12	17:13	13.63	6.71	--	NP	6.92	--
P-11	09/25/12	7:44	13.63	7.42	--	NP	6.21	--
P-11	12/13/12	10:41	13.63	6.08	--	NP	7.55	--
P-11	03/25/13	10:27	13.63	6.52	--	NP	7.11	--
P-11	06/24/13	11:48	13.63	7.11	--	NP	6.52	--
P-11	09/23/13	13:46	13.63	7.02	--	NP	6.61	--
P-11	12/16/13	10:23	13.63	7.19	--	NP	6.44	--
P-11	03/26/14	8:37	13.63	6.31	--	NP	7.32	--
P-11	06/16/14	13:40	13.63	7.02	--	NP	6.61	--
P-11	09/29/14	13:50	13.63	6.95	--	NP	6.68	--
P-11	12/08/14	12:35	13.63	6.29	--	NP	7.34	--
P-11	03/23/15	14:24	13.63	6.40	--	NP	7.23	--
P-11	06/22/15	15:29	13.63	7.20	--	NP	6.43	--
P-11	10/27/16	9:44	13.63	5.83	--	NP	7.80	--
P-11 <sup>DB2</sup>	07/24/17	--	--	--	--	--	--	Not part of the monitoring network
P-12	08/25/11	12:42	13.03	7.26	--	NP	5.77	--
P-12	09/02/11	10:14	13.03	7.10	--	NP	5.93	--
P-12	09/09/11	8:08	13.03	7.11	--	NP	5.92	--
P-12	09/16/11	14:10	13.03	7.18	--	<0.01	5.85	Field note not available
P-12	09/26/11	12:37	13.03	7.16	7.15	0.01	5.88	See **
P-12	10/28/11	10:03	13.03	6.91	--	NP	6.12	--
P-12	11/18/11	9:13	13.03	6.98	--	NP	6.05	--
P-12	12/12/11	13:59	13.03	6.61	--	NP	6.42	--
P-12	03/27/12	14:24	13.03	6.11	--	NP	6.92	--
P-12	06/27/12	17:08	13.03	6.70	6.61	0.09	6.40	See **
P-12	09/25/12	8:05	13.03	7.32	7.25	0.07	5.77	See **
P-12	12/13/12	10:41	13.03	5.91	--	<0.01	7.12	Film observed during gauging
P-12	03/25/13	10:43	13.03	6.56	--	<0.01	6.47	Film observed during gauging
P-12	06/24/13	12:35	13.03	6.98	6.91	0.07	6.11	See **
P-12	09/23/13	14:20	13.03	6.71	6.69	0.02	6.34	See **
P-12	12/16/13	10:56	13.03	7.03	6.95	0.08	6.06	See **
P-12	03/26/14	9:11	13.03	6.30	--	<0.01	6.73	Film observed during gauging
P-12	06/16/14	14:55	13.03	--	7.82	--	--	See +
P-12	09/29/14	14:57	13.03	--	6.50	--	--	See +
P-12	12/08/14	12:18	13.03	5.98	--	NP	7.05	--
P-12	03/23/15	14:12	13.03	6.41	--	<0.01	6.62	Film observed during gauging
P-12	06/22/15	15:00	13.03	--	7.00	--	--	See +
P-12	10/27/16	9:41	13.03	6.30	5.83	0.47	7.11	See **
P-12 <sup>DB2</sup>	07/26/17	16:15	13.03	7.42	7.1	0.32	5.87	Not part of the monitoring network
P-13	08/25/11	12:40	13.02	6.90	--	NP	6.12	--
P-13	09/02/11	10:17	13.02	6.84	--	NP	6.18	--
P-13	09/09/11	8:11	13.02	6.89	--	NP	6.13	--
P-13	09/16/11	14:17	13.02	6.91	--	<0.01	6.11	Field note not available
P-13	09/26/11	12:23	13.02	6.93	6.9	0.03	6.11	See **
P-13	10/28/11	10:20	13.02	6.75	6.74	0.01	6.28	See **
P-13	11/18/11	9:19	13.02	--	6.66	--	--	See +
P-13	12/12/11	12:11	13.02	6.46	6.23	0.23	6.74	See **
P-13	03/27/12	14:11	13.02	5.70	5.60	0.10	7.40	See **
P-13	06/27/12	16:47	13.02	--	6.15	--	--	See +
P-13	09/25/12	8:26	13.02	--	6.90	--	--	See +
P-13	12/13/12	11:00	13.02	--	5.50	--	--	See +
P-13	03/25/13	10:31	13.02	--	5.98	--	--	See +
P-13	06/24/13	12:23	13.02	--	6.54	--	--	See +
P-13	09/23/13	14:00	13.02	7.60	6.35	1.25	6.42	See **
P-13	12/16/13	10:43	13.02	7.94	6.59	1.35	6.16	See **
P-13	03/26/14	8:15	13.02	--	5.65	--	--	See +
P-13	06/16/14	15:00	13.02	--	8.63	--	--	See +
P-13	09/29/14	15:12	13.02	7.60	6.27	1.33	6.48	See **
P-13	12/08/14	12:29	13.02	7.50	5.54	1.96	7.09	See **
P-13	03/23/15	14:00	13.02	6.89	5.70	1.19	7.08	See **

**Table 3-3**  
**Groundwater Elevation Data**  
**Former Unocal Edmonds Bulk Fuel Terminal**  
**11720 Unoco Road**  
**Edmonds, Washington**

Monitoring Well	Date	Time	Top of Casing Elevation (feet)	Depth to Water (top of casing) (feet)	Depth to LNAPL (feet)	LNAPL Thickness (feet)	Groundwater Elevation (feet amsl)	Comment
P-13	06/22/15	14:45	13.02	7.92	6.60	1.32	6.16	See **
P-13	10/27/16	9:34	13.02	5.20	5.07	0.13	7.92	See **
P-13 <sup>UB2</sup>	07/26/17	15:32	13.02	6.63	6.61	0.02	6.41	Not part of the monitoring network
P-14	08/25/11	12:38	12.14	6.79	--	NP	5.35	--
P-14	09/02/11	10:21	12.14	6.37	--	NP	5.77	--
P-14	09/09/11	8:14	12.14	6.50	--	NP	5.64	--
P-14	09/16/11	14:23	12.14	6.51	--	NP	5.63	--
P-14	09/26/11	12:19	12.14	6.60	--	NP	5.54	--
P-14	10/28/11	10:16	12.14	6.13	--	NP	6.01	--
P-14	11/18/11	9:16	12.14	6.24	--	NP	5.90	--
P-14	12/12/11	14:03	12.14	5.98	--	NP	6.16	--
P-14	03/27/12	14:03	12.14	5.78	--	NP	6.36	--
P-14	06/27/12	17:10	12.14	6.15	--	NP	5.99	--
P-14	09/25/12	7:41	12.14	6.79	--	NP	5.35	--
P-14	12/13/12	10:30	12.14	5.31	--	NP	6.83	--
P-14	03/25/13	11:30	12.14	6.22	--	NP	5.92	--
P-14	06/24/13	12:17	12.14	6.43	--	NP	5.71	--
P-14	09/23/13	13:45	12.14	6.00	--	NP	6.14	--
P-14	12/16/13	10:43	12.14	6.25	--	NP	5.89	--
P-14	03/26/14	8:30	12.14	5.66	--	NP	6.48	--
P-14	06/16/14	15:10	12.14	6.52	--	NP	5.62	--
P-14	09/29/14	15:48	12.14	5.95	--	NP	6.19	--
P-14	12/08/14	13:19	12.14	5.30	--	NP	6.84	--
P-14	03/23/15	14:54	12.14	5.71	--	NP	6.43	--
P-14	06/22/15	14:41	12.14	6.57	--	NP	5.57	--
P-14	10/27/16	10:05	12.14	5.39	--	NP	6.75	--
P-14 <sup>UB2</sup>	07/24/17	--	--	--	--	--	--	Not part of the monitoring network
P-15	08/25/11	12:30	12.54	7.48	--	NP	5.06	--
P-15	09/02/11	10:23	12.54	6.97	--	NP	5.57	--
P-15	09/09/11	8:17	12.54	7.22	--	NP	5.32	--
P-15	09/16/11	14:48	12.54	7.10	--	NP	5.44	--
P-15	09/26/11	10:56	12.54	7.15	--	NP	5.39	--
P-15	10/28/11	10:11	12.54	6.68	--	NP	5.86	--
P-15	11/18/11	9:09	12.54	6.83	--	NP	5.71	--
P-15	12/12/11	12:55	12.54	6.65	--	NP	5.89	--
P-15	03/27/12	14:07	12.54	6.34	--	NP	6.20	--
P-15	06/27/12	17:08	12.54	6.79	--	NP	5.75	--
P-15	09/25/12	7:45	12.54	7.35	--	NP	5.19	--
P-15	12/13/12	11:20	12.54	5.90	--	NP	6.64	--
P-15	03/25/13	11:05	12.54	-- <sup>+</sup>	6.65	-- <sup>+</sup>	-- <sup>+</sup>	See +
P-15	06/24/13	11:53	12.54	6.90	6.76	0.14	5.75	See **
P-15	09/23/13	14:30	12.54	6.55	--	NP	5.99	--
P-15	12/16/13	10:25	12.54	6.84	6.78	0.06	5.75	See **
P-15	03/26/14	8:48	12.54	-- <sup>+</sup>	6.33	-- <sup>+</sup>	-- <sup>+</sup>	See +
P-15	06/16/14	15:15	12.54	-- <sup>+</sup>	7.29	-- <sup>+</sup>	-- <sup>+</sup>	See +
P-15	09/29/14	15:35	12.54	6.53	6.51	0.02	6.03	See **
P-15	12/08/14	12:06	12.54	5.83	--	NP	6.71	--
P-15	03/23/15	14:24	12.54	6.50	--	NP	6.04	LNAPL observed on probe during gauging
P-15	06/22/15	15:13	12.54	7.18	--	NP	5.36	--
P-15	10/27/16	10:15	12.54	5.92	--	<0.01	6.62	Film observed during gauging, confirmed with bailer
P-15 <sup>UB2</sup>	07/26/17	16:30	12.54	7.52	7.18	0.34	5.29	Not part of the monitoring network
P-16	08/25/11	12:25	9.04	3.60	--	NP	5.44	--
P-16	09/02/11	10:25	9.04	3.41	--	NP	5.63	--
P-16	09/09/11	8:19	9.04	3.42	--	NP	5.62	--
P-16	09/16/11	14:52	9.04	3.39	--	NP	5.65	--
P-16	09/26/11	11:00	9.04	3.38	--	NP	5.66	--
P-16	10/28/11	10:07	9.04	3.14	--	NP	5.90	--
P-16	11/18/11	9:07	9.04	3.22	--	NP	5.82	--
P-16	12/12/11	12:38	9.04	2.93	--	NP	6.11	--
P-16	03/27/12	14:06	9.04	2.43	--	NP	6.61	--
P-16	06/27/12	17:11	9.04	2.86	--	NP	6.18	--
P-16	09/25/12	7:51	9.04	3.45	--	NP	5.59	--
P-16	12/13/12	10:19	9.04	2.31	--	NP	6.73	--
P-16	03/25/13	10:24	9.04	2.55	--	NP	6.49	--
P-16	06/24/13	12:40	9.04	2.88	--	NP	6.16	--
P-16	09/23/13	13:53	9.04	2.96	--	NP	6.08	--
P-16	12/16/13	10:45	9.04	3.01	--	NP	6.03	--
P-16	03/26/14	8:35	9.04	2.73	--	NP	6.31	--
P-16	06/16/14	15:05	9.04	3.25	--	NP	5.79	--
P-16	09/29/14	15:50	9.04	2.95	--	NP	6.09	--
P-16	12/08/14	12:10	9.04	2.35	--	NP	6.69	--
P-16	03/23/15	14:49	9.04	2.47	--	NP	6.57	--
P-16	06/22/15	15:40	9.04	3.32	--	NP	5.72	--

**Table 3-3**  
**Groundwater Elevation Data**  
**Former Unocal Edmonds Bulk Fuel Terminal**  
**11720 Unoco Road**  
**Edmonds, Washington**

Monitoring Well	Date	Time	Top of Casing Elevation (feet)	Depth to Water (top of casing) (feet)	Depth to LNAPL (feet)	LNAPL Thickness (feet)	Groundwater Elevation (feet amsl)	Comment
P-16	10/27/16	10:30	9.04	2.66	--	NP	6.38	--
P-16 <sup>DBZ</sup>	07/24/17	--	--	--	--	--	--	Not part of the monitoring network
<b>Staff Gauges</b>								
D-1 <sup>1</sup>	06/22/09	10:43	8.84 <sup>3</sup>	2.58	--	NP	6.26	--
D-1 <sup>1</sup>	06/22/09	12:31		2.81	--	NP	6.03	--
D-1 <sup>1</sup>	08/03/09	9:34		2.85	--	NP	5.99	--
D-1 <sup>1</sup>	08/03/09	12:02		2.82	--	NP	6.02	--
D-1 <sup>1</sup>	08/17/09	7:48		2.79	--	NP	6.05	--
D-1 <sup>1</sup>	08/17/09	10:59		2.87	--	NP	5.97	--
D-1 <sup>1</sup>	10/29/09	7:48		2.68	--	NP	6.16	--
D-1 <sup>1</sup>	10/29/09	10:08		2.54	--	NP	6.30	--
D-1 <sup>1</sup>	01/18/10	12:34		1.48	--	NP	7.36	--
D-1 <sup>1</sup>	01/18/10	14:39		1.83	--	NP	7.01	--
D-1 <sup>1</sup>	04/19/10	14:09		2.62	--	NP	6.22	--
D-1 <sup>1</sup>	04/19/10	16:13		2.78	--	NP	6.06	--
D-1 <sup>1</sup>	07/19/10	5:35		2.50	--	NP	6.34	--
D-1 <sup>1</sup>	07/19/10	9:08		3.86	--	NP	4.98	--
D-1 <sup>1</sup>	10/25/10	12:18		1.30	--	NP	7.54	--
D-1 <sup>1</sup>	10/25/10	15:33		1.85	--	NP	6.99	--
D-1 <sup>1</sup>	03/21/11	11:17		2.50	--	NP	6.34	--
D-1 <sup>1</sup>	03/21/11	13:56		2.80	--	NP	6.04	--
D-1 <sup>1</sup>	06/14/11	8:54		2.40	--	NP	6.44	--
D-1 <sup>1</sup>	06/14/11	12:49		2.92	--	NP	5.92	--
D-1 <sup>1</sup>	09/26/11	8:56		2.43	--	NP	6.41	--
D-1 <sup>1</sup>	09/26/11	--		2.69	--	NP	6.15	--
D-1 <sup>1</sup>	12/12/11	10:15		2.27	--	NP	6.57	--
D-1 <sup>1</sup>	12/12/11	14:40		2.70	--	NP	6.14	--
D-1 <sup>1</sup>	03/27/12	12:43		2.16	--	NP	6.68	--
D-1 <sup>1</sup>	03/27/12	13:46		2.75	--	NP	6.09	--
D-1 <sup>1</sup>	06/27/12	15:11		2.90	--	NP	5.94	--
D-1 <sup>1</sup>	06/27/12	18:40		2.85	--	NP	5.99	--
D-1 <sup>1</sup>	09/25/12	6:15		2.90	--	NP	5.94	--
D-1 <sup>1</sup>	09/25/12	9:35		2.88	--	NP	5.96	--
D-1 <sup>1</sup>	12/13/12	9:03		1.95	--	NP	6.89	--
D-1 <sup>1</sup>	12/13/12	12:18		2.41	--	NP	6.43	--
D-1 <sup>1</sup>	03/25/13	9:00		2.28	--	NP	6.56	--
D-1 <sup>1</sup>	03/25/13	11:45		2.96	--	NP	5.88	--
D-1 <sup>1</sup>	06/24/13	10:36		1.80	--	NP	7.04	--
D-1 <sup>1</sup>	06/24/13	13:05		2.58	--	NP	6.26	--
D-1 <sup>1</sup>	09/23/13	12:20		1.61	--	NP	7.23	--
D-1 <sup>1</sup>	09/23/13	15:35		2.78	--	NP	6.06	--
D-1 <sup>1</sup>	12/16/13	9:33		2.72	--	NP	6.12	--
D-1 <sup>1</sup>	12/16/13	11:32		2.91	--	NP	5.93	--
D-1 <sup>1</sup>	03/26/14	6:55		1.38	--	NP	7.46	--
D-1 <sup>1</sup>	03/26/14	10:00		2.21	--	NP	6.63	--
D-1 <sup>1</sup>	06/16/14	12:52		2.64	--	NP	6.20	--
D-1 <sup>1</sup>	06/16/14	14:42		2.21	--	NP	6.63	--
D-1 <sup>1</sup>	09/29/14	13:55		2.01	--	NP	6.83	--
D-1 <sup>1</sup>	09/29/14	16:20		2.77	--	NP	6.07	--
D-1 <sup>1</sup>	12/08/14	10:30		1.97	--	NP	6.87	--
D-1 <sup>1</sup>	12/08/14	13:35		2.50	--	NP	6.34	--
D-1 <sup>1</sup>	03/23/14	12:37		1.90	--	NP	6.94	--
D-1 <sup>1</sup>	03/23/14	15:30		2.55	--	NP	6.29	--
D-1 <sup>1</sup>	06/22/15	14:10		2.88	--	NP	5.96	--
D-1 <sup>1</sup>	06/22/15	16:19		2.89	--	NP	5.95	--
D-1 <sup>1</sup>	10/27/16	7:45		1.94	--	NP	6.90	--
D-1 <sup>1</sup>	10/27/16	10:34		2.50	--	NP	6.34	--
D-1 <sup>1DBZ</sup>	07/24/17	11:15		2.29	--	NP	6.55	--
D-1 <sup>1DBZ</sup>	07/24/17	14:03		2.67	--	NP	6.17	--
D-2	10/20/08	17:15	5.60	1.20	--	NP	6.80	--
D-2	12/08/08	11:05		1.24	--	NP	6.84	--
D-2	02/20/09	9:55		0.60	--	NP	6.20	--
D-2	04/20/09	9:49		0.20	--	NP	5.80	--
D-2	06/22/09	10:50	8.67 <sup>3</sup>	2.30	--	NP	6.37	--
D-2	06/22/09	12:35		2.44	--	NP	6.23	--
D-2	08/03/09	9:40		2.43	--	NP	6.24	--
D-2	08/03/09	12:05		2.45	--	NP	6.22	--
D-2	08/17/09	7:53		2.50	--	NP	6.17	--
D-2	08/17/09	11:03		2.50	--	NP	6.17	--
D-2	10/29/09	7:52		2.35	--	NP	6.32	--
D-2	10/29/09	10:14		2.25	--	NP	6.42	--
D-2	01/18/10	12:38		1.38	--	NP	7.29	--
D-2	01/18/10	14:43		1.76	--	NP	6.91	--

**Table 3-3**  
**Groundwater Elevation Data**  
**Former Unocal Edmonds Bulk Fuel Terminal**  
**11720 Unoco Road**  
**Edmonds, Washington**

Monitoring Well	Date	Time	Top of Casing Elevation (feet)	Depth to Water (top of casing) (feet)	Depth to LNAPL (feet)	LNAPL Thickness (feet)	Groundwater Elevation (feet amsl)	Comment
D-2	04/19/10	14:14		2.32	--	NP	6.35	--
D-2	04/19/10	16:16		2.44	--	NP	6.23	--
D-2	07/19/10	5:46		2.26	--	NP	6.41	--
D-2	07/19/10	9:13		2.45	--	NP	6.22	--
D-2	10/25/10	12:23		1.00	--	NP	7.67	--
D-2	10/25/10	15:40		1.60	--	NP	7.07	--
D-2	03/21/11	11:21		2.27	--	NP	6.40	--
D-2	03/21/11	14:06		2.45	--	NP	6.22	--
D-2	06/14/11	9:23		2.64	--	NP	6.03	--
D-2	06/14/11	12:54		2.45	--	NP	6.22	--
D-2	09/26/11	9:25		2.30	--	NP	6.37	--
D-2	09/26/11	--		2.39	--	NP	6.28	--
D-2	12/12/11	10:21		2.09	--	NP	6.58	--
D-2	12/12/11	14:47		2.50	--	NP	6.17	--
D-2	03/27/12	12:49		2.00	--	NP	6.67	--
D-2	03/27/12	15:51		2.88	--	NP	5.79	--
D-2	06/27/12	15:28		2.50	--	NP	6.17	--
D-2	06/27/12	18:45		2.50	--	NP	6.17	--
D-2	09/25/12	6:20		2.60	--	NP	6.07	--
D-2	09/25/12	9:42		2.53	--	NP	6.14	--
D-2	12/13/12	9:10		1.80	--	NP	6.87	--
D-2	12/13/12	12:05		2.34	--	NP	6.33	--
D-2	03/25/13	9:07		2.07	--	NP	6.60	--
D-2	03/25/13	11:40		2.53	--	NP	6.14	--
D-2	06/24/13	10:44		1.60	--	NP	7.07	--
D-2	06/24/13	12:44		2.30	--	NP	6.37	--
D-2	09/23/13	12:10		1.49	--	NP	7.18	--
D-2	09/23/13	15:45		2.59	--	NP	6.08	--
D-2	12/16/13	9:40		2.65	--	NP	6.02	--
D-2	12/16/13	11:36		2.74	--	NP	5.93	--
D-2	03/26/14	7:05		1.51	--	NP	7.16	--
D-2	03/26/14	10:10		2.32	--	NP	6.35	--
D-2	06/16/14	12:59		2.74	--	NP	5.93	--
D-2	06/16/14	14:47		2.83	--	NP	5.84	--
D-2	09/29/14	14:15		2.24	--	NP	6.43	--
D-2	09/29/14	16:15		2.80	--	NP	5.87	--
D-2	12/08/14	10:40		2.15	--	NP	6.52	--
D-2	12/08/14	13:40		2.66	--	NP	6.01	--
D-2	03/23/15	12:50		1.87	--	NP	6.80	--
D-2	03/26/15	15:39		2.69	--	NP	5.98	--
D-2	06/22/15	14:06		2.89	--	NP	5.78	--
D-2	06/22/15	16:29		2.91	--	NP	5.76	--
D-2	10/27/16	7:55		2.11	--	NP	6.56	--
D-2	10/27/16	10:27		2.63	--	NP	6.04	--
D-2	07/24/17	11:28		4.50	--	NP	4.17	--
D-2	07/24/17	14:10		2.70	--	NP	5.97	--
D-2	03/19/18	12:08		2.17	--	NP	6.50	--
D-2	03/19/18	13:46		2.63	--	NP	6.04	--
D-2	06/26/18	--	--	--	--	--	--	Not part of the monitoring network
D-3	10/20/08	17:18	5.20	1.90	--	NP	7.10	--
D-3	12/08/08	11:09		1.78	--	NP	6.98	--
D-3	02/20/09	9:59		1.20	--	NP	6.40	--
D-3	04/20/09	9:53		1.20	--	NP	6.40	--
D-3	06/22/09	11:02	8.39 <sup>3</sup>	2.19	--	NP	6.20	--
D-3	06/22/09	12:40		2.24	--	NP	6.15	--
D-3	08/03/09	9:49		2.30	--	NP	6.09	--
D-3	08/03/09	12:10		2.23	--	NP	6.16	--
D-3	08/17/09	7:57		2.19	--	NP	6.20	--
D-3	08/17/09	11:08		2.40	--	NP	5.99	--
D-3	10/29/09	7:55		2.07	--	NP	6.32	--
D-3	10/29/09	10:13		2.04	--	NP	6.35	--
D-3	01/18/10	12:23		1.22	--	NP	7.17	--
D-3	01/18/10	14:46		1.52	--	NP	6.87	--
D-3	04/19/10	14:18		2.12	--	NP	6.27	--
D-3	04/19/10	16:22		2.29	--	NP	6.10	--
D-3	07/19/10	5:55		2.10	--	NP	6.29	--
D-3	07/19/10	9:17		2.28	--	NP	6.11	--
D-3	10/25/10	12:29		0.80	--	NP	7.59	--
D-3	10/25/10	15:42		1.45	--	NP	6.94	--
D-3	03/21/11	11:25		2.30	--	NP	6.09	--
D-3	03/21/11	14:05		2.50	--	NP	5.89	--
D-3	06/14/11	9:06		2.05	--	NP	6.34	--
D-3	06/14/11	12:59		2.35	--	NP	6.04	--

**Table 3-3**  
**Groundwater Elevation Data**  
**Former Unocal Edmonds Bulk Fuel Terminal**  
**11720 Unoco Road**  
**Edmonds, Washington**

Monitoring Well	Date	Time	Top of Casing Elevation (feet)	Depth to Water (top of casing) (feet)	Depth to LNAPL (feet)	LNAPL Thickness (feet)	Groundwater Elevation (feet amsl)	Comment
D-3	09/26/11	9:45		2.19	--	NP	6.20	--
D-3	09/26/11	--		2.08	--	NP	6.31	--
D-3	12/12/11	10:27		3.16	--	NP	5.23	--
D-3	12/12/11	14:55		3.47	--	NP	4.92	--
D-3	03/27/12	12:53		2.94	--	NP	5.45	--
D-3	03/27/12	15:55		3.53	--	NP	4.86	--
D-3	06/27/12	15:22		-- <sup>4</sup>	--	NP	-- <sup>4</sup>	--
D-3	06/27/12	18:52	8.70 <sup>5</sup>	2.60	--	NP	6.10	--
D-3	09/25/12	6:25		2.72	--	NP	5.98	--
D-3	09/25/12	9:45		2.73	--	NP	5.97	--
D-3	12/13/12	9:15		1.90	--	NP	6.80	--
D-3	12/13/12	12:09		2.40	--	NP	6.30	--
D-3	03/25/13	9:15		2.20	--	NP	6.50	--
D-3	03/25/13	11:37		2.60	--	NP	6.10	--
D-3	06/24/13	10:49		1.81	--	NP	6.89	--
D-3	06/24/13	12:37		2.45	--	NP	6.25	--
D-3	09/23/13	12:45		1.42	--	NP	7.28	--
D-3	09/23/13	15:55		2.65	--	NP	6.05	--
D-3	12/16/13	9:44		2.55	--	NP	6.15	--
D-3	12/16/13	11:39		2.65	--	NP	6.05	--
D-3	03/26/14	7:10		1.25	--	NP	7.45	--
D-3	03/26/14	10:15		2.06	--	NP	6.64	--
D-3	06/16/14	12:59		2.44	--	NP	6.26	--
D-3	06/16/14	14:49		2.54	--	NP	6.16	--
D-3	09/29/14	14:10		2.83	--	NP	5.87	--
D-3	09/29/14	--	--	--	--	--	--	D-3 appears to have been moved
D-3	12/08/14	10:50		3.07	--	NP	--	Top of casing elevation not available
D-3	12/08/14	13:50		0.59	--	NP	--	Top of casing elevation not available
D-3	03/23/15	12:44		2.67	--	NP	--	Top of casing elevation not available
D-3	03/23/15	15:40		3.56	--	NP	--	Top of casing elevation not available
D-3	06/22/15	14:00		3.82	--	NP	--	Top of casing elevation not available
D-3	06/22/15	16:30		3.83	--	NP	--	Top of casing elevation not available
D-3	10/27/16	8:05		3.02	--	NP	--	Top of casing elevation not available
D-3	10/27/16	10:21		3.49	--	NP	--	Top of casing elevation not available
D-3	07/24/17	--	--	--	--	--	--	Unable to access. Top of casing elevation not available
D-3	07/24/17	--	--	--	--	--	--	Unable to access. Top of casing elevation not available
D-3	03/19/18	12:14		3.09	--	NP	--	Top of casing elevation not available
D-3	03/19/18	13:42		3.51	--	NP	--	Top of casing elevation not available
D-3	06/26/18	--	--	--	--	--	--	Not part of the monitoring network
D-4 <sup>2</sup>	06/22/09	10:19	9.39 <sup>3</sup>	2.96	--	NP	6.43	--
D-4 <sup>2</sup>	06/22/09	12:54		2.81	--	NP	6.58	--
D-4 <sup>2</sup>	08/03/09	10:09		2.93	--	NP	6.46	--
D-4 <sup>2</sup>	08/03/09	12:25		2.95	--	NP	6.44	--
D-4 <sup>2</sup>	08/17/09	8:10		2.92	--	NP	6.47	--
D-4 <sup>2</sup>	08/17/09	11:19		2.94	--	NP	6.45	--
D-4 <sup>2</sup>	10/29/09	8:19		2.74	--	NP	6.65	--
D-4 <sup>2</sup>	10/29/09	10:34		2.59	--	NP	6.80	--
D-4 <sup>2</sup>	01/18/10	12:55		2.06	--	NP	7.33	--
D-4 <sup>2</sup>	01/18/10	15:00		2.35	--	NP	7.04	--
D-4 <sup>2</sup>	04/19/10	14:33		2.87	--	NP	6.52	--
D-4 <sup>2</sup>	04/19/10	16:39		2.95	--	NP	6.44	--
D-4 <sup>2</sup>	07/19/10	6:19		2.90	--	NP	6.49	--
D-4 <sup>2</sup>	07/19/10	9:34		3.00	--	NP	6.39	--
D-4 <sup>2</sup>	10/25/10	12:45		1.70	--	NP	7.69	--
D-4 <sup>2</sup>	10/25/10	15:36		2.40	--	NP	6.99	--
D-4 <sup>2</sup>	03/21/11	11:48		2.83	--	NP	6.56	--
D-4 <sup>2</sup>	03/21/11	14:15		2.90	--	NP	6.49	--
D-4 <sup>2</sup>	06/14/11	9:00		2.35	--	NP	7.04	--
D-4 <sup>2</sup>	06/14/11	13:12		2.93	--	NP	6.46	--
D-4 <sup>2</sup>	09/26/11	10:00		2.82	--	NP	6.57	--
D-4 <sup>2</sup>	09/26/11	--		3.03	--	NP	6.36	--
D-4 <sup>2</sup>	12/12/11	10:48		2.86	--	NP	6.53	--
D-4 <sup>2</sup>	12/12/11	15:05		2.18	--	NP	7.21	--
D-4 <sup>2</sup>	03/27/12	13:05		2.70	--	NP	6.69	--
D-4 <sup>2</sup>	03/27/12	16:14		3.01	--	NP	6.38	--
D-4 <sup>2</sup>	06/27/12	15:43		3.05	--	NP	6.34	--
D-4 <sup>2</sup>	06/27/12	19:02		3.00	--	NP	6.39	--
D-4 <sup>2</sup>	09/25/12	6:35		3.09	--	NP	6.30	--
D-4 <sup>2</sup>	09/25/12	9:55		3.05	--	NP	6.34	--
D-4 <sup>2</sup>	12/13/12	9:35		2.45	--	NP	6.94	--
D-4 <sup>2</sup>	12/13/12	12:35		2.77	--	NP	6.62	--
D-4 <sup>2</sup>	03/25/13	9:30		2.83	--	NP	6.56	--
D-4 <sup>2</sup>	03/25/13	11:05		3.05	--	NP	6.34	--

**Table 3-3**  
**Groundwater Elevation Data**  
**Former Unocal Edmonds Bulk Fuel Terminal**  
**11720 Unoco Road**  
**Edmonds, Washington**

Monitoring Well	Date	Time	Top of Casing Elevation (feet)	Depth to Water (top of casing) (feet)	Depth to LNAPL (feet)	LNAPL Thickness (feet)	Groundwater Elevation (feet amsl)	Comment
D-4 <sup>2</sup>	06/24/13	11:00		2.42	--	NP	6.97	--
D-4 <sup>2</sup>	06/24/13	13:30		3.04	--	NP	6.35	--
D-4 <sup>2</sup>	09/23/13	13:00		2.16	--	NP	7.23	--
D-4 <sup>2</sup>	09/23/13	16:10		3.08	--	NP	6.31	--
D-4 <sup>2</sup>	12/16/13	9:54		3.08	--	NP	6.31	--
D-4 <sup>2</sup>	12/16/13	11:50		3.13	--	NP	6.26	--
D-4 <sup>2</sup>	03/26/14	7:20		1.90	--	NP	7.49	--
D-4 <sup>2</sup>	03/26/14	10:20		2.69	--	NP	6.70	--
D-4 <sup>2</sup>	06/16/14	13:00		3.02	--	NP	6.37	--
D-4 <sup>2</sup>	06/16/14	14:57		3.04	--	NP	6.35	--
D-4 <sup>2</sup>	09/29/14	14:25		2.66	--	NP	6.73	--
D-4 <sup>2</sup>	09/29/14	16:00		2.98	--	NP	6.41	--
D-4 <sup>2</sup>	12/08/14	11:00		2.50	--	NP	6.89	--
D-4 <sup>2</sup>	12/08/14	13:55		3.00	--	NP	6.39	--
D-4 <sup>2</sup>	03/23/15	12:55		2.18	--	NP	7.21	--
D-4 <sup>2</sup>	03/23/15	15:32		2.94	--	NP	6.45	--
D-4 <sup>2</sup>	06/22/15	14:38		3.08	--	NP	6.31	--
D-4 <sup>2</sup>	06/22/15	16:46		3.11	--	NP	6.28	--
D-4 <sup>2</sup>	10/27/16	8:25		2.39	--	NP	7.00	--
D-4 <sup>2</sup>	10/27/16	10:48		2.68	--	NP	6.71	--
D-4 <sup>2</sup>	07/24/17	11:46		2.74	--	NP	6.65	--
D-4 <sup>2</sup>	07/24/17	14:22		2.90	--	NP	6.49	--
D-4 <sup>2</sup>	03/19/18	12:30		2.56	--	NP	6.83	--
D-4 <sup>2</sup>	03/19/18	13:30		2.78	--	NP	6.61	--
D-4 <sup>2</sup>	06/26/18	--	--	--	--	--	--	Not part of the monitoring network
D-5	10/20/08	--	--	--	--	--	--	--
D-5	12/08/08	11:18	5.60	1.25	--	NP	6.85	--
D-5	02/20/09	9:45		0.30	--	NP	5.90*	See *
D-5	04/20/09	9:22		0.10	--	NP	5.70	--
D-5	06/22/09	10:39	9.09 <sup>3</sup>	2.88	--	NP	6.21	--
D-5	06/22/09	12:28		3.10	--	NP	5.99	--
D-5	08/03/09	9:32		3.10	--	NP	5.99	--
D-5	08/03/09	11:59		3.12	--	NP	5.97	--
D-5	08/17/09	7:46		3.12	--	NP	5.97	--
D-5	08/17/09	10:56		3.17	--	NP	5.92	--
D-5	10/29/09	7:45		2.99	--	NP	6.10	--
D-5	10/29/09	10:04		2.88	--	NP	6.21	--
D-5	01/18/10	12:29		1.76	--	NP	7.33	--
D-5	01/18/10	14:35		2.10	--	NP	6.99	--
D-5	04/19/10	14:05		2.87	--	NP	6.22	--
D-5	04/19/10	16:10		Dry	--	NP	DRY	--
D-5	07/19/10	5:32		2.78	--	NP	6.31	--
D-5	07/19/10	9:04		Dry	--	NP	DRY	--
D-5	10/25/10	12:15		1.50	--	NP	7.59	--
D-5	10/25/10	15:33		2.11	--	NP	6.98	--
D-5	03/21/11	11:13		2.80	--	NP	6.29	--
D-5	03/21/11	13:54		3.10	--	NP	5.99	--
D-5	06/14/11	8:50		2.65	--	NP	6.44	--
D-5	06/14/11	12:46		3.19	--	NP	5.90	--
D-5	09/26/11	8:50		2.69	--	NP	6.40	--
D-5	09/26/11	--		2.99	--	NP	6.10	--
D-5	12/12/11	10:09		2.49	--	NP	6.60	--
D-5	12/12/11	14:35		2.99	--	NP	6.10	--
D-5	03/27/12	12:36		2.44	--	NP	6.65	--
D-5	03/27/12	15:41		3.13	--	NP	5.96	--
D-5	06/27/12	15:10		3.20	--	NP	5.89	--
D-5	06/27/12	18:37		3.20	--	NP	5.89	--
D-5	09/25/12	6:10		Dry	--	NP	DRY	--
D-5	09/25/12	9:30		Dry	--	NP	DRY	--
D-5	12/13/12	9:00		2.20	--	NP	6.89	--
D-5	12/13/12	12:00		2.77	--	NP	6.32	--
D-5	03/25/13	8:55		2.55	--	NP	6.54	--
D-5	03/25/13	11:49		Dry	--	NP	DRY	--
D-5	06/24/13	10:33		2.08	--	NP	7.01	--
D-5	06/24/13	13:16		2.90	--	NP	6.19	--
D-5	09/23/13	12:10		1.88	--	NP	7.21	--
D-5	09/23/13	15:30		2.09	--	NP	7.00	--
D-5	12/16/13	9:29		3.01	--	NP	6.08	--
D-5	12/16/13	11:22		Dry	--	NP	DRY	--
D-5	03/26/14	6:50		1.66	--	NP	7.43	--
D-5	03/26/14	9:55		2.50	--	NP	6.59	--
D-5	06/16/14	12:48		2.95	--	NP	6.14	--
D-5	06/16/14	14:40		3.13	--	NP	5.96	--

**Table 3-3**  
**Groundwater Elevation Data**  
**Former Unocal Edmonds Bulk Fuel Terminal**  
**11720 Unoco Road**  
**Edmonds, Washington**

Monitoring Well	Date	Time	Top of Casing Elevation (feet)	Depth to Water (top of casing) (feet)	Depth to LNAPL (feet)	LNAPL Thickness (feet)	Groundwater Elevation (feet amsl)	Comment
D-5	09/29/14	13:50		2.29	--	NP	6.80	--
D-5	09/29/14	16:22		3.08	--	NP	6.01	--
D-5	12/08/14	10:20		2.29	--	NP	6.80	--
D-5	12/08/14	13:25		2.74	--	NP	6.35	--
D-5	03/23/15	12:34		2.20	--	NP	6.89	--
D-5	03/23/15	15:25		2.86	--	NP	6.23	--
D-5	06/22/15	14:12		3.20	--	NP	5.89	--
D-5	06/22/15	16:22		3.21	--	NP	5.88	--
D-5	10/27/16	7:40		2.27	--	NP	6.82	--
D-5	10/27/16	10:36		2.87	--	NP	6.22	--
D-5	07/24/17	11:12		2.61	--	NP	6.48	--
D-5	07/24/17	14:00		3.00	--	NP	6.09	--
D-5	03/19/18	12:03		2.35	--	NP	6.74	--
D-5	03/19/18	13:51		2.79	--	NP	6.30	--
D-5	06/26/18	--	--	--	--	--	--	Not part of the monitoring network
D-6	10/20/08	--	--	--	--	--	--	
D-6	12/08/08	11:22	2.80	3.00	--	NP	5.80	--
D-6	02/20/09	10:16		4.40	--	NP	7.20	--
D-6	04/20/09	9:40		4.30	--	NP	7.10	--
D-6	06/22/09	11:10	8.11 <sup>3</sup>	3.12	--	NP	4.99	--
D-6	06/22/09	12:46		3.12	--	NP	4.99	--
D-6	08/03/09	9:59		3.30	--	NP	4.81	--
D-6	08/03/09	12:16		3.29	--	NP	4.82	--
D-6	08/17/09	8:02		3.30	--	NP	4.81	--
D-6	08/17/09	11:14		3.29	--	NP	4.82	--
D-6	10/29/09	8:09		2.76	--	NP	5.35	--
D-6	10/29/09	10:34		2.71	--	NP	5.40	--
D-6	01/18/10	12:46		3.77	--	NP	4.34	--
D-6	01/18/10	14:52		3.80	--	NP	4.31	--
D-6	04/19/10	14:25		2.20	--	NP	5.91	--
D-6	04/19/10	16:30		2.30	--	NP	5.81	--
D-6	07/19/10	6:08		2.35	--	NP	5.76	--
D-6	07/19/10	9:26		2.35	--	NP	5.76	--
D-6	10/25/10	12:36		1.65	--	NP	6.46	--
D-6	10/25/10	15:48		1.61	--	NP	6.50	--
D-6	03/21/11	11:35		1.64	--	NP	6.47	--
D-6	03/21/11	14:08		1.65	--	NP	6.46	Replaced by D-6R
D-6R	06/14/11	8:57	9.11	3.72	--	NP	5.39	--
D-6R	06/14/11	12:50		3.72	--	NP	5.39	--
D-6R	09/26/11	9:00		3.95	--	NP	5.16	--
D-6R	09/26/11	--		3.90	--	NP	5.21	--
D-6R	12/12/11	10:17		3.69	--	NP	5.42	--
D-6R	12/12/11	14:42		3.69	--	NP	5.42	--
D-6R	03/27/12	12:45		2.78	--	NP	6.33	--
D-6R	03/27/12	15:48		2.75	--	NP	6.36	--
D-6R	06/27/12	15:15		2.94	--	NP	6.17	--
D-6R	06/27/12	18:42		2.94	--	NP	6.17	--
D-6R	09/25/12	6:17		3.49	--	NP	5.62	--
D-6R	09/25/12	9:39		3.46	--	NP	5.65	--
D-6R	12/13/12	9:06		2.70	--	NP	6.41	--
D-6R	12/13/12	12:15		2.70	--	NP	6.41	--
D-6R	03/25/13	9:02		2.15	--	NP	6.96	--
D-6R	03/25/13	11:44		2.15	--	NP	6.96	--
D-6R	06/24/13	10:39		2.65	--	NP	6.46	--
D-6R	06/24/13	13:00		2.65	--	NP	6.46	--
D-6R	09/23/13	12:30		3.51	--	NP	5.60	--
D-6R	09/23/13	15:40		3.50	--	NP	5.61	--
D-6R	12/16/13	9:36		2.79	--	NP	6.32	--
D-6R	12/16/13	11:31		2.79	--	NP	6.32	--
D-6R	03/26/14	7:00		3.09	--	NP	6.02	--
D-6R	03/26/14	10:05		3.09	--	NP	6.02	--
D-6R	06/16/14	12:59		3.02	--	NP	6.09	--
D-6R	06/16/14	14:45		3.02	--	NP	6.09	--
D-6R	09/29/14	14:00		3.27	--	NP	5.84	--
D-6R	09/29/14	16:10		3.32	--	NP	5.79	--
D-6R	12/08/14	11:10		3.00	--	NP	6.11	--
D-6R	12/08/14	14:00		3.01	--	NP	6.10	--
D-6R	03/23/15	12:40		3.29	--	NP	5.82	--
D-6R	03/23/15	15:35		3.34	--	NP	5.77	--
D-6R	06/22/15	16:25		3.53	--	NP	5.58	--
D-6R	10/27/16	7:50		2.80	--	NP	6.31	--
D-6R	10/27/16	10:30		2.79	--	NP	6.32	--
D-6R <sup>DEZ</sup>	07/24/17	11:20		2.41	--	NP	6.70	--

**Table 3-3**  
**Groundwater Elevation Data**  
**Former Unocal Edmonds Bulk Fuel Terminal**  
**11720 Unoco Road**  
**Edmonds, Washington**

Monitoring Well	Date	Time	Top of Casing Elevation (feet)	Depth to Water (top of casing) (feet)	Depth to LNAPL (feet)	LNAPL Thickness (feet)	Groundwater Elevation (feet amsl)	Comment
D-6R <sup>DB2</sup>	07/24/17	14:05		2.46	--	NP	6.65	--
D-7	10/20/08	17:23	7.60	Dry	--	NP	DRY	--
D-7	12/08/08	11:31		Dry	--	NP	DRY	--
D-7	02/20/09	10:48		Dry	--	NP	DRY	--
D-7	04/20/09	10:23		Dry	--	NP	DRY	--
TB	10/20/08	17:05	4.70	2.30	--	NP	7.00	--
TB	12/08/08	11:16		2.50	--	NP	7.20	--
TB	02/20/09	9:37		1.10	--	NP	5.80	--
TB	04/20/09	9:20		1.33	--	NP	6.03	--
TB	06/22/09	10:35		1.63	--	NP	6.33	--
TB	06/22/09	12:25		1.85	--	NP	6.55	--
TB	08/03/09	9:27		1.83	--	NP	6.53	--
TB	08/03/09	11:56		1.83	--	NP	6.53	--
TB	08/17/09	7:41		1.83	--	NP	6.53	--
TB	08/17/09	10:52		1.88	--	NP	6.58	--
TB	10/29/09	7:41		1.69	--	NP	6.39	--
TB	10/29/09	10:01		1.64	--	NP	6.34	--
TB	01/18/10	12:18		0.45	--	NP	5.15	--
TB	01/18/10	14:24		0.90	--	NP	5.60	--
TB	04/19/10	14:00		1.74	--	NP	6.44	--
TB	04/19/10	16:07		1.94	--	NP	6.64	--
TB	07/19/10	5:28		1.59	--	NP	6.29	--
TB	07/19/10	9:01		1.97	--	NP	6.67	--
TB	10/25/10	12:11		4.20	--	NP	8.90	--
TB	10/25/10	15:30		0.86	--	NP	5.56	--
TB	06/14/11	8:47		1.49	--	NP	6.19	--
TB	06/14/11	12:42		1.95	--	NP	6.65	--
TB	09/26/11	8:47		1.51	--	NP	6.21	--
TB	09/26/11	--		1.74	--	NP	6.44	--
TB	12/12/11	10:05		1.19	--	NP	5.89	--
TB	12/12/11	14:30		1.70	--	NP	6.40	--
TB	03/27/12	12:32		1.33	--	NP	6.03	--
TB	03/27/12	15:37		1.99	--	NP	6.69	--
TB	06/27/12	15:00		1.95	--	NP	6.65	--
TB	06/27/12	18:31		2.00	--	NP	6.70	--
TB	09/25/12	6:05		1.99	--	NP	6.69	--
TB	09/25/12	9:25		1.98	--	NP	6.68	--
TB	12/13/12	8:55		0.90	--	NP	5.60	--
TB	12/13/12	11:55		1.49	--	NP	6.19	--
TB	03/25/13	8:50		1.40	--	NP	6.10	--
TB	03/25/13	11:54		1.94	--	NP	6.64	--
TB	06/24/13	10:27		1.03	--	NP	5.73	--
TB	06/24/13	12:18		1.73	--	NP	6.43	--
TB	09/23/13	12:00		2.51	--	NP	7.21	--
TB	09/23/13	15:20		3.68	--	NP	8.38	--
TB	12/16/13	9:24		1.76	--	NP	6.46	--
TB	12/16/13	11:17		2.03	--	NP	6.73	--
TB	03/26/14	6:40		2.43	--	NP	7.13	--
TB	03/26/14	9:50		3.22	--	NP	7.92	--
TB	06/16/14	12:45		3.56	--	NP	8.26	--
TB	06/16/14	14:37		3.74	--	NP	8.44	--
TB	09/29/14	13:45		1.83	--	NP	6.53	--
TB	09/29/14	16:30		3.81	--	NP	8.51	--
TB	12/08/14	10:10		2.85	--	NP	7.55	--
TB	12/08/14	13:20		3.31	--	NP	8.01	--
TB	03/23/15	12:30		2.93	--	NP	7.63	--
TB	03/23/15	15:20		3.50	--	NP	8.20	--
TB	06/22/15	14:29		3.85	--	NP	8.55	--
TB	06/22/15	16:14		3.88	--	NP	8.58	--
TB	10/27/16	7:37		2.99	--	NP	7.69	--
TB	10/27/16	10:39		3.50	--	NP	8.20	--
TB	07/24/17	11:09		3.29	--	NP	7.99	--
TB	07/24/17	13:58		3.64	--	NP	8.34	--
TB	03/19/18	11:59		3.12	--	NP	7.82	--
TB	03/19/18	13:56		3.53	--	NP	8.23	--
TB	06/26/18	--	--	--	--	--	--	Not part of the monitoring network



**Table 3-3**  
**Groundwater Elevation Data**  
**Former Unocal Edmonds Bulk Fuel Terminal**  
**11720 Unoco Road**  
**Edmonds, Washington**

Monitoring Well	Date	Time	Top of Casing Elevation (feet)	Depth to Water (top of casing) (feet)	Depth to LNAPL (feet)	LNAPL Thickness (feet)	Groundwater Elevation (feet amsl)	Comment
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**Notes:**

amsl= Above Mean Sea Level

LNAPL = Light non-aqueous phase liquid

"-" = Not measured.

NP = Not present

<sup>1</sup> Staff gauge D-1 re-established prior to June 2009 sampling event.

<sup>2</sup> Staff gauge D-4 was established prior to June 2009 sampling event to replace staff gauge D-7 which is not within the Willow Creek channel.

<sup>3</sup> Staff gauges were resurveyed by OTAK Incorporated June 1, 2009. Staff gauges were surveyed from top of gauge and water levels are now measured from top down to water.

<sup>4</sup> Staff gauge D-3 was down during the first gauging of the June 27, 2012 gauging event. A depth to water reading was unable to be collected.

<sup>5</sup> Staff gauge D-3 was re-established for the second gauging of the June 27, 2012 gauging event and was re-surveyed by OTAK Incorporated on 8/8/12.

\* = Potentially anomalous reading that will be confirmed with subsequent gauging data.

\*\* = Groundwater elevation adjusted for the presence of LNAPL.

+ = LNAPL thickness could not be accurately measured due to LNAPL coating oil/water interface probe tip.

^ = Measurement error. LNAPL measurement was not confirmed with a bailer at the time the measurement was collected. The measurement was re-collected on 06/23/09 and there was no indication of LNAPL or LNAPL film. A bailer was used to confirm the measurement on 06/23/09 and there were no signs of LNAPL, sheen or odor present in MW-104.

<sup>S</sup> = Shallow piezometer (installed between 12 and 13 feet below ground surface).

<sup>D</sup> = Deep piezometer (installed between 22 and 25 feet below ground surface).

<sup>DB2</sup> = Wells and piezometers located within the DB-2 excavation footprint and decommissioned during the construction work related to DB-2 excavation activities in August 2017.

Table 3-4  
 Summary of Groundwater Analytical Data  
 Petroleum and Polynuclear Aromatic Hydrocarbons  
 Former Unocal Edmonds Bulk Fuel Terminal  
 11720 Unoco Road  
 Edmonds, Washington

Monitoring Well	Date Sampled	BTEX <sup>1</sup> (µg/L)								Total cPAHs Adjusted for Toxicity <sup>2</sup> (µg/L)		Diesel <sup>3</sup> (µg/L)		Gasoline <sup>4</sup> (µg/L)		Heavy Oil <sup>3</sup> (µg/L)		TPH <sup>5</sup> (µg/L)		TPH CUL <sup>6</sup> (µg/L)
		B		T		E		X		CUL=0.05		--		--		--		see note 6		
		CUL=16	U	--	U	--	U	--	U		UU		U		U		U		UU	
LM-2*	10/23/08	0.50	U	0.50	U	0.50	U	1.00	U	0.007	UU	243	U	50	U	485	U	389	UU	512
LM-2*	12/11/08	0.50	U	0.50	U	0.50	U	1.00	U	0.008		243	U	50	U	485	U	389	UU	512
LM-2*	02/26/09	0.5	U	NA		NA		NA		0.008	UU	1,300		50	U	510		1,835		503
LM-2*	04/23/09	0.5	U	NA		NA		NA		0.007	UU	1,100		50	U	230		1,355		503
LM-2*	06/25/09	0.5	U	NA		NA		NA		0.007	UU	520		50	U	370		915		505
LM-2*	08/20/09	0.5	U	NA		NA		NA		0.012	UU	290		50	U	71		386		512
LM-2*	10/30/09	0.5	U	NA		NA		NA		0.013	UU	1,500		50	U	700		2,225		502
LM-2*	01/20/10	NA		NA		NA		NA		NA		1,100		50	U	500		1,625		503
LM-2*	04/21/10	NA		NA		NA		NA		NA		1,100		50	U	460		1,585		503
LM-2*	07/22/10	NA		NA		NA		NA		NA		1,500		50	U	550		2,075		502
LM-2*	10/29/10	0.5	U	NA		NA		NA		0.012	UU	2,500		50	U	1,400		3,925		501
LM-2*	03/23/11	NA		NA		NA		NA		NA		1,600		50	U	1,000		2,625		502
LM-2*	06/16/11	NA		NA		NA		NA		NA		1,800		50	U	520		2,345		502
LM-2*	09/28/11	NA		NA		NA		NA		NA		29	U	50	U	67	U	73	UU	574
LM-2*	12/16/11	0.2	U	NA		NA		NA		0.007	UU	28	U	50	U	66	U	72	UU	575
LM-2*	03/29/12	NA		NA		NA		NA		NA		3,900		50	U	2,000		5,925		501
LM-2*	06/29/12	NA		NA		NA		NA		NA		32	U	50	U	74	U	78	UU	568
LM-2*	09/27/12	NA		NA		NA		NA		NA		29	U	50	U	67	U	73	UU	574
LM-2*	12/18/12	0.2	U	NA		NA		NA		0.011		30	U	50	U	71	U	76	UU	571
LM-2*	03/27/13	NA		NA		NA		NA		NA		31	U	50	U	72	U	77	UU	570
LM-2*	06/26/13	NA		NA		NA		NA		NA		30		250	U	69	U	190		664
LM-2*	09/24/13	NA		NA		NA		NA		NA		33		50	U	70	U	93		556
LM-2*	12/18/13	0.2	U	NA		NA		NA		0.008	UU	30	U	50	U	69	U	75	UU	572
LM-2*	03/27/14	NA		NA		NA		NA		NA		29	U	50	U	67	U	73	UU	574
LM-2*	06/17/14	NA		NA		NA		NA		NA		29	U	50	U	67	U	73	UU	574
LM-2*	09/30/14	NA		NA		NA		NA		NA		38		50	U	68	U	97		553
LM-2*	12/09/14	0.3		NA		NA		NA		0.008	UU	29	U	50	U	67	U	73	UU	574
LM-2*	03/25/15	NA		NA		NA		NA		NA		29	U	50	U	68	U	74	UU	573
LM-2*	06/24/15	NA		NA		NA		NA		NA		28	U	250	U	66	U	172	UU	687
LM-2*	10/26/16	0.5	U	0.5	U	0.5	U	1.5	U	0.008		46	U	50	U	100	U	98	UU	553
LM-2*	07/26/17	25	U	NA		NA		NA		0.008		48	U	2500	U	110	U	1,329	UU	772
LM-2*	03/20/18	2.9		NA		NA		NA		0.109		95		500	U	100	U	395		656
LM-2*	06/27/18	5.0	U	NA		NA		NA		0.008	UU	260		500	U	220		730		574
LM-2*	09/20/18	0.5	U	NA		NA		NA		0.008	UU	54	U	19	U	120	U	97	UU	519
LM-2*	11/27/18	5.0	U	NA		NA		NA		0.008	UU	46	U	190	U	100	U	168	UU	635
MW-101*	10/22/08	0.50	U	0.50	U	0.50	U	1.00	U	0.007	UU	250	U	50	U	500	U	400	UU	512
MW-101*	12/10/08	0.50	U	0.50	U	0.50	U	1.00	U	0.007	UU	245	U	50	U	490	U	393	UU	512
MW-101*	02/24/09	0.5	U	NA		NA		NA		0.008	UU	160		83		72	U	279		563
MW-101*	04/22/09	0.5	U	NA		NA		NA		0.008	UU	160		50	U	79	U	225		522
MW-101*	06/25/09	0.5	U	NA		NA		NA		0.007	UU	36		50	U	69	U	96		554
MW-101*	08/20/09	0.5	U	NA		NA		NA		0.012	UU	82		50	U	74	U	144		535
MW-101*	10/27/09	0.5	U	NA		NA		NA		0.013	UU	310		50	U	74	U	372		513
MW-101*	01/19/10	NA		NA		NA		NA		NA		28	U	50	U	66	U	72	UU	575
MW-101*	04/21/10	NA		NA		NA		NA		NA		75		75		78	U	189		587
MW-101*	07/21/10	NA		NA		NA		NA		NA		98		50	U	74	U	160		531
MW-101* (Duplicate)	07/21/10	NA		NA		NA		NA		NA		100		50	U	73	U	162		531
MW-101*	10/27/10	0.5	U	NA		NA		NA		0.012	UU	130		120		67	U	284		594
MW-101*	03/23/11	NA		NA		NA		NA		NA		34		50	U	67	U	93		556
MW-101*	06/15/11	NA		NA		NA		NA		NA		70		50	U	67	U	129		539
MW-101* (Duplicate)	06/15/11	NA		NA		NA		NA		NA		68		50	U	70		163		531
MW-101*	09/27/11	NA		NA		NA		NA		NA		29	U	50	U	67	U	73	UU	574
MW-101*	12/14/11	0.2	U	NA		NA		NA		0.007	UU	32	U	50	U	75	U	79	UU	568
MW-101*	03/28/12	NA		NA		NA		NA		NA		29	U	50	U	67	U	73	UU	574
MW-101*	06/29/12	NA		NA		NA		NA		NA		29	U	50	U	67	U	73	UU	574
MW-101*	09/27/12	NA		NA		NA		NA		NA		30	U	50	U	70	U	75	UU	571

Table 3-4  
 Summary of Groundwater Analytical Data  
 Petroleum and Polynuclear Aromatic Hydrocarbons  
 Former Unocal Edmonds Bulk Fuel Terminal  
 11720 Unoco Road  
 Edmonds, Washington

Monitoring Well	Date Sampled	BTEX <sup>1</sup> (µg/L)				Total cPAHs Adjusted for Toxicity <sup>2</sup> (µg/L)	Diesel <sup>3</sup> (µg/L)	Gasoline <sup>4</sup> (µg/L)	Heavy Oil <sup>3</sup> (µg/L)	TPH <sup>5</sup> (µg/L)	TPH CUL <sup>6</sup> (µg/L)
		B	T	E	X						
		CUL=16	--	--	--						
MW-101* (Duplicate)	09/27/12	NA	NA	NA	NA	30	50	71	76	571	
MW-101*	12/18/12	0.2 U	NA	NA	0.008 UU	29	50	68	74	573	
MW-101*	03/26/13	NA	NA	NA	NA	29	50	67	73	574	
MW-101*	06/25/13	NA	NA	NA	NA	29	50	67	73	574	
MW-101*	09/25/13	NA	NA	NA	NA	29	50	68	74	573	
MW-101*	12/20/13	0.2 U	NA	NA	0.008 UU	29	50	67	73	574	
MW-101*	03/28/14	NA	NA	NA	NA	28	50	66	72	575	
MW-101*	06/18/14	NA	NA	NA	NA	29	50	67	73	574	
MW-101*	10/01/14	NA	NA	NA	NA	30	50	71	76	571	
MW-101*	12/10/14	0.2 U	NA	NA	0.008 UU	29	50	67	73	574	
MW-101*	03/25/15	NA	NA	NA	NA	29	50	67	73	574	
MW-101*	06/25/15	NA	NA	NA	NA	28	50	66	72	575	
MW-101*	10/25/16	0.5 U	0.5 U	0.5 U	1.5 U	0.008 UU	45	76	100	149	619
MW-101*	07/25/17	0.5 U	NA	NA	NA	0.008 UU	46	50	100	98	553
MW-101* (Duplicate)	07/25/17	0.5 U	NA	NA	NA	0.008 UU	46	50	100	98	553
MW-101*	03/22/18	0.5 U	NA	NA	NA	0.008 UU	47	50	440	489	510
MW-101*	06/28/18	0.5 U	NA	NA	NA	0.008 UU	45	50	100	98	553
MW-101*	09/18/18	0.5 U	NA	NA	NA	0.008 UU	50	140	110	220	657
MW-101* (Duplicate)	09/18/18	0.5 U	NA	NA	NA	0.008 UU	47	140	100	214	663
MW-101*	11/28/18	0.5 U	NA	NA	NA	0.008 UU	45	900	100	973	766
MW-101*	02/07/19	0.03 U	NA	NA	NA	0.008 UU	46	19	100	83	523
MW-104*	10/22/08	3.89	0.554 U	11.8	1.00 U	0.008 UU	253	728	505	1,107	664
MW-104*	12/10/08	3.41	0.50 U	23.5	1.15	0.007 UU	245	859	490	1,227	678
MW-104*	02/24/09	1.4	NA	NA	NA	0.007 UU	130	460	68	624	691
MW-104*	04/23/09	5 U	NA	NA	NA	0.008 UU	180	1,700	70	1,915	750
MW-104* (Duplicate)	04/23/09	5 U	NA	NA	NA	0.008 UU	210	1,800	72	2,046	746
MW-104*	06/24/09	2.9	NA	NA	NA	0.007 UU	140	740	72	916	717
MW-104*	08/19/09	2	NA	NA	NA	0.012 UU	120	310	68	464	667
MW-104*	10/27/09	2	NA	NA	NA	0.013 UU	130	510	73	677	697
MW-104*	01/19/10	NA	NA	NA	NA	NA	270	2,800	69	3,105	756
MW-104*	04/21/10	NA	NA	NA	NA	NA	100	400	83	542	692
MW-104* (Duplicate)	04/21/10	NA	NA	NA	NA	NA	100	510	67	644	711
MW-104*	07/20/10	NA	NA	NA	NA	NA	200	450	72	686	663
MW-104*	10/27/10	1.7	NA	NA	NA	0.047 UU	81	220	67	335	664
MW-104*	03/23/11	NA	NA	NA	NA	NA	290	890	68	1,214	690
MW-104*	06/15/11	NA	NA	NA	NA	NA	340	1,900	67	2,274	728
MW-104* (Duplicate)	06/15/11	NA	NA	NA	NA	NA	350	1,900	67	2,317	722
MW-104*	09/27/11	NA	NA	NA	NA	NA	29	50	67	73	574
MW-104*	12/13/11	3.0 U	NA	NA	NA	0.072 UU	38	700	66	771	758
MW-104*	03/29/12	NA	NA	NA	NA	NA	440	280	220	940	563
MW-104*	06/28/12	NA	NA	NA	NA	NA	29	83	67	131	656
MW-104*	09/26/12	NA	NA	NA	NA	NA	33	170	66	236	685
MW-104*	12/18/12	0.2 U	NA	NA	NA	0.008 UU	29	50	67	73	574
MW-104*	03/27/13	NA	NA	NA	NA	NA	52	310	120	396	708
MW-104*	06/26/13	NA	NA	NA	NA	NA	29	78	68	127	650
MW-104*	09/24/13	NA	NA	NA	NA	NA	30	190	70	240	711
MW-104* (Duplicate)	09/24/13	NA	NA	NA	NA	NA	44	170	70	249	672
MW-104*	12/17/13	0.4	NA	NA	NA	0.008 UU	29	120	68	169	682
MW-104*	03/26/14	NA	NA	NA	NA	NA	29	50	67	73	574
MW-104*	06/17/14	NA	NA	NA	NA	NA	29	50	67	73	574
MW-104* (Duplicate)	06/17/14	NA	NA	NA	NA	NA	28	50	66	72	575
MW-104*	09/30/14	NA	NA	NA	NA	NA	30	50	69	90	559
MW-104*	12/09/14	1.0 U	NA	NA	NA	0.008 UU	29	50	67	73	574
MW-104*	03/25/15	NA	NA	NA	NA	NA	30	59	69	109	628
MW-104*	06/23/15	NA	NA	NA	NA	NA	28	64	66	111	638

Table 3-4  
 Summary of Groundwater Analytical Data  
 Petroleum and Polynuclear Aromatic Hydrocarbons  
 Former Unocal Edmonds Bulk Fuel Terminal  
 11720 Unoco Road  
 Edmonds, Washington

Monitoring Well	Date Sampled	BTEX <sup>1</sup> (µg/L)				Total cPAHs Adjusted for Toxicity <sup>2</sup> (µg/L)		Diesel <sup>3</sup> (µg/L)	Gasoline <sup>4</sup> (µg/L)	Heavy Oil <sup>3</sup> (µg/L)	TPH <sup>5</sup> (µg/L)	TPH CUL <sup>6</sup> (µg/L)								
		B	T	E	X	CUL=0.05														
		CUL=16	--	--	--	CUL=0.05														
MW-104*	10/24/16	0.5	U	0.5	U	11.0	1.5	U	0.008	UU	46	U	350	100	U	423		725		
MW-104*	07/26/17	0.5	U	NA		NA	NA		0.008	UU	45	U	120	100	U	193		653		
MW-104*	03/20/18	0.2	U	NA		NA	NA		0.008	UU	46	U	91	100	U	164		631		
MW-104*	06/27/18	0.5	U	NA		NA	NA		0.008	UU	46	U	50	U	100	98	UU	553		
MW-104*	09/17/18	0.5	U	NA		NA	NA		0.008	UU	46	U	19	U	100	83	UU	523		
MW-104*	11/27/18	0.5	U	NA		NA	NA		0.008	UU	47	U	36	100	U	110		570		
MW-108*	10/23/08	0.50	U	0.50	U	0.50	U	1.00	U	0.007	UU	243	U	50	U	485	U	389	UU	512
MW-108*	12/11/08	0.50	U	0.50	U	0.50	U	1.00	U	0.007	UU	243	U	50	U	485	U	389	UU	512
MW-108*	02/26/09	0.5	U	NA		NA	NA		0.007	UU	31	U	50	U	71	U	76	UU	570	
MW-108*	04/23/09	2.5	U	NA		NA	NA		0.007	UU	39	U	250	U	66	U	322		705	
MW-108*	06/25/09	0.5	U	NA		NA	NA		0.007	UU	28	U	50	U	66	U	72	UU	575	
MW-108*	08/20/09	0.5	U	NA		NA	NA		0.012	UU	36	U	50	U	68	U	95		555	
MW-108*	10/30/09	0.5	U	NA		NA	NA		0.014	UU	40	U	50	U	71	U	101		551	
MW-108*	01/20/10	NA		NA		NA	NA		NA		28	U	50	U	66	U	72	UU	575	
MW-108*	04/21/10	NA		NA		NA	NA		NA		75	U	50	U	67	U	134		538	
MW-108*	07/22/10	NA		NA		NA	NA		NA		76	U	50	U	76	U	139		536	
MW-108*	10/29/10	0.5	U	NA		NA	NA		0.0119225	UU	29	U	50	U	67	U	73	UU	574	
MW-108*	03/23/11	NA		NA		NA	NA		NA		33	U	50	U	67	U	92		557	
MW-108*	06/16/11	NA		NA		NA	NA		NA		140	U	50	U	68	U	199		525	
MW-108*	09/28/11	NA		NA		NA	NA		NA		30	U	50	U	69	U	75	UU	572	
MW-108*	12/16/11	0.2	U	NA		NA	NA		0.00717	UU	29	U	50	U	67	U	73	UU	574	
MW-108*	03/29/12	NA		NA		NA	NA		NA		110	U	50	U	150		285		517	
MW-108*	06/29/12	NA		NA		NA	NA		NA		30	U	50	U	71	U	76	UU	571	
MW-108*	09/27/12	NA		NA		NA	NA		NA		29	U	50	U	67	U	73	UU	574	
MW-108*	12/18/12	0.2	U	NA		NA	NA		0.008	UU	31	U	50	U	72	U	77	UU	570	
MW-108*	03/27/13	NA		NA		NA	NA		NA		31	U	50	U	72	U	77	UU	570	
MW-108*	06/27/13	NA		NA		NA	NA		NA		29	U	50	U	67	U	73	UU	574	
MW-108*	09/26/13	NA		NA		NA	NA		NA		28	U	50	U	66	U	72	UU	575	
MW-108*	12/19/13	0.2	U	NA		NA	NA		0.008	UU	32	U	50	U	74	U	78	UU	568	
MW-108*	03/27/14	NA		NA		NA	NA		NA		30	U	50	U	69	U	75	UU	572	
MW-108*	06/17/14	NA		NA		NA	NA		NA		29	U	50	U	67	U	73	UU	574	
MW-108*	10/02/14	NA		NA		NA	NA		NA		29	U	50	U	68	U	74	UU	573	
MW-108*	12/09/14	0.2	U	NA		NA	NA		0.008	UU	29	U	50	U	67	U	73	UU	574	
MW-108*	03/26/15	NA		NA		NA	NA		NA		29	U	500	U	68	U	299	UU	729	
MW-108*	06/24/15	NA		NA		NA	NA		NA		28	U	250	U	66	U	172	UU	687	
MW-109*	10/23/08	0.50	U	0.50	U	0.50	U	1.00	U	0.008	UU	253	U	50	U	505	U	404	UU	512
MW-109*	12/12/08	0.50	U	0.50	U	0.50	U	1.00	U	0.007	UU	248	U	50	U	495	U	397	UU	512
MW-109*	02/26/09	0.5	U	NA		NA	NA		0.008	UU	32	U	50	U	75	U	79	UU	568	
MW-109*	04/23/09	0.5	U	NA		NA	NA		0.007	UU	29	U	50	U	67	U	73	UU	574	
MW-109*	06/25/09	0.5	U	NA		NA	NA		0.007	UU	29	U	50	U	67	U	73	UU	574	
MW-109*	08/20/09	0.5	U	NA		NA	NA		0.012	UU	29	U	50	U	67	U	73	UU	574	
MW-109*	10/30/09	0.5	U	NA		NA	NA		0.012	UU	29	U	50	U	67	U	73	UU	574	
MW-109*	01/20/10	NA		NA		NA	NA		NA		29	U	50	U	67	U	73	UU	574	
MW-109*	04/21/10	NA		NA		NA	NA		NA		55	U	50	U	67	U	114		545	
MW-109*	07/22/10	NA		NA		NA	NA		NA		31	U	50	U	72	U	77	UU	570	
MW-109*	10/29/10	0.5	U	NA		NA	NA		0.012	UU	29	U	50	U	67	U	73	UU	574	
MW-109*	03/23/11	NA		NA		NA	NA		NA		29	U	50	U	67	U	73	UU	574	
MW-109*	06/16/11	NA		NA		NA	NA		NA		96	U	50	U	100		221		522	
MW-109*	09/28/11	NA		NA		NA	NA		NA		32	U	50	U	75	U	79	UU	568	
MW-109*	12/16/11	0.2	U	NA		NA	NA		0.0072	UU	29	U	50	U	66	U	87		560	
MW-109*	03/29/12	NA		NA		NA	NA		NA		29	U	50	U	68	U	74	UU	573	
MW-109*	06/29/12	NA		NA		NA	NA		NA		30	U	50	U	69	U	75	UU	572	
MW-109*	09/27/12	NA		NA		NA	NA		NA		29	U	50	U	67	U	73	UU	574	
MW-109*	12/18/12	0.2	U	NA		NA	NA		0.008	UU	33	U	50	U	77	U	80	UU	566	
MW-109*	03/27/13	NA		NA		NA	NA		NA		31	U	50	U	72	U	77	UU	570	

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 Former Unocal Edmonds Bulk Fuel Terminal  
 11720 Unoco Road  
 Edmonds, Washington

Monitoring Well	Date Sampled	BTEX <sup>1</sup> (µg/L)				Total cPAHs Adjusted for Toxicity <sup>2</sup> (µg/L)		Diesel <sup>3</sup> (µg/L)	Gasoline <sup>4</sup> (µg/L)	Heavy Oil <sup>3</sup> (µg/L)	TPH <sup>5</sup> (µg/L)	TPH CUL <sup>6</sup> (µg/L)						
		B	T	E	X	CUL=0.05												
		CUL=16	--	--	--	CUL=0.05												
MW-109*	06/27/13	NA	NA	NA	NA	NA	29	U	50	U	68	U	74	UU	573			
MW-109* (Duplicate)	06/27/13	NA	NA	NA	NA	NA	28	U	50	U	66	U	72	UU	575			
MW-109*	09/26/13	NA	NA	NA	NA	NA	28	U	50	U	66	U	72	UU	575			
MW-109*	12/19/13	0.2	U	NA	NA	0.008	UU	31	U	50	73	U	77	UU	569			
MW-109*	03/27/14	NA	U	NA	NA	NA	54	U	67	U	50	U	113	UU	563			
MW-109*	06/17/14	NA	U	NA	NA	NA	29	U	50	U	68	U	74	UU	573			
MW-109*	10/02/14	NA	U	NA	NA	NA	29	U	50	U	67	U	73	UU	574			
MW-109*	12/09/14	0.2	U	NA	NA	0.008	UU	29	U	50	67	U	73	UU	574			
MW-109*	03/26/15	NA	U	NA	NA	NA	29	U	50	U	67	U	73	UU	574			
MW-109*	06/24/15	NA	U	NA	NA	NA	28	U	50	U	66	U	72	UU	575			
MW-126	06/29/12	NA	U	NA	NA	NA	30	U	50	U	70	U	75	UU	571			
MW-126 (Duplicate)	06/29/12	NA	U	NA	NA	NA	31	U	50	U	71	U	76	UU	570			
MW-126	12/18/12	0.2	U	NA	NA	0.008	UU	170	50	U	68	U	229	UU	521			
MW-126	06/25/13	NA	U	NA	NA	NA	29	U	50	U	68	U	74	UU	573			
MW-126	12/17/13	0.2	U	NA	NA	0.008	UU	29	50	U	67	U	73	UU	574			
MW-126 (Duplicate)	12/17/13	0.2	U	NA	NA	0.008	UU	29	50	U	67	U	73	UU	574			
MW-126	06/18/14	NA	U	NA	NA	NA	29	U	50	U	67	U	73	UU	574			
MW-126	12/10/14	0.2	U	NA	NA	0.008	UU	210	50	U	67	U	269	UU	518			
MW-126	06/23/15	NA	U	NA	NA	NA	28	U	50	U	65	U	72	UU	575			
MW-126	10/24/16	0.5	U	0.5	U	0.5	U	1.5	U	50	100	U	98	UU	553			
MW-126	07/25/17	0.5	U	NA	NA	0.008	UU	45	50	U	100	U	98	UU	553			
MW-126	03/22/18	0.5	U	NA	NA	0.008	UU	47	50	U	110	U	104	UU	550			
MW-126	06/29/18	0.5	U	NA	NA	0.008	UU	45	50	U	100	U	98	UU	553			
MW-126	09/18/18	0.5	U	NA	NA	0.008	UU	48	19	U	110	U	89	UU	521			
MW-126	11/30/18	0.5	U	NA	NA	0.008	UU	46	19	U	100	U	83	UU	523			
MW-126 (Duplicate)	11/30/18	0.5	U	NA	NA	0.008	UU	45	19	U	100	U	82	UU	523			
MW-129R*	10/24/08	0.50	U	0.50	U	0.50	U	1.12	0.007	UU	250	U	68.1	500	U	443	531	
MW-129R*	12/12/08	0.50	U	0.50	U	0.50	U	1.00	0.008	UU	245	U	50	490	U	393	UU	512
MW-129R*	02/27/09	0.5	U	NA	NA	NA	NA	0.007	UU	1,900	50	U	730		2,655	502		
MW-129R*	04/27/09	0.5	U	NA	NA	NA	NA	0.007	UU	1,400	50	U	250		1,675	503		
MW-129R*	06/26/09	0.5	U	NA	NA	NA	NA	0.007	UU	1,700	50	U	1,000		2,725	502		
MW-129R*	08/21/09	0.5	U	NA	NA	NA	NA	0.012	UU	3,400	50	U	1,000		4,425	501		
MW-129R*	10/28/09	0.5	U	NA	NA	NA	NA	0.013	UU	1,900	50	U	240		2,165	502		
MW-129R*	01/21/10	NA	U	NA	NA	NA	NA	NA	1,800	50	U	650		2,475	502			
MW-129R*	04/22/10	NA	U	NA	NA	NA	NA	NA	1,600	50	U	390		2,015	502			
MW-129R*	07/22/10	NA	U	NA	NA	NA	NA	NA	1,800	50	U	400		2,225	502			
MW-129R*	11/01/10	0.5	U	NA	NA	0.012	UU	1,900	50	U	700		2,625	502				
MW-129R*	03/23/11	NA	U	NA	NA	NA	NA	1,700	50	UU	550		2,300	504				
MW-129R* (Duplicate)	03/23/11	NA	U	NA	NA	NA	NA	1,700	50	U	650		2,375	502				
MW-129R*	06/17/11	NA	U	NA	NA	NA	NA	1,600	50	U	310		1,935	502				
MW-129R*	09/28/11	NA	U	NA	NA	NA	NA	2,700	50	U	230		2,955	502				
MW-129R*	12/19/11	0.2	U	NA	NA	0.007	UU	45	50	U	67	U	104	UU	550			
MW-129R*	03/29/12	NA	U	NA	NA	NA	NA	1,700	55	U	300		2,055	505				
MW-129R* (Duplicate)	03/29/12	NA	U	NA	NA	NA	NA	87	56	U	67	U	177	UU	568			
MW-129R*	07/02/12	NA	U	NA	NA	NA	NA	44	50	U	67	U	103	UU	550			
MW-129R*	09/27/12	NA	U	NA	NA	NA	NA	330	50	U	75	U	393	UU	512			
MW-129R*	12/18/12	0.2	U	NA	NA	0.009	UU	32	50	U	68	U	91	UU	557			
MW-129R*	03/27/13	NA	U	NA	NA	NA	NA	29	50	U	67	U	88	UU	560			
MW-129R*	06/26/13	NA	U	NA	NA	NA	NA	30	50	U	68	U	114	UU	598			
MW-129R*	09/24/13	NA	U	NA	NA	NA	NA	30	U	50	69	U	75	UU	572			
MW-129R*	12/18/13	0.2	U	NA	NA	0.008	UU	33	50	U	71	U	94	UU	556			
MW-129R*	03/26/14	NA	U	NA	NA	NA	NA	46	56	U	67	U	136	UU	592			
MW-129R*	06/18/14	NA	U	NA	NA	NA	NA	80	50	U	66	U	138	UU	536			
MW-129R*	09/30/14	NA	U	NA	NA	NA	NA	310	50	U	68	U	369	UU	513			
MW-129R*	12/09/14	0.2	U	NA	NA	0.008	UU	36	50	U	66	U	94	UU	555			

Table 3-4  
 Summary of Groundwater Analytical Data  
 Petroleum and Polynuclear Aromatic Hydrocarbons  
 Former Unocal Edmonds Bulk Fuel Terminal  
 11720 Unoco Road  
 Edmonds, Washington

Monitoring Well	Date Sampled	BTEX <sup>1</sup> (µg/L)				Total cPAHs Adjusted for Toxicity <sup>2</sup> (µg/L)		Diesel <sup>3</sup> (µg/L)	Gasoline <sup>4</sup> (µg/L)	Heavy Oil <sup>3</sup> (µg/L)	TPH <sup>5</sup> (µg/L)	TPH CUL <sup>6</sup> (µg/L)
		B	T	E	X	CUL=0.05						
		CUL=16	--	--	--	CUL=0.05						
MW-129R*	03/26/15	NA	NA	NA	NA	NA	100	52	67	186	559	
MW-129R*	06/23/15	NA	NA	NA	NA	NA	51	50	66	109	547	
MW-129R*	07/26/17	0.5	U	NA	NA	0.008	46	93	100	166	633	
MW-129R*	03/20/18	0.2	U	NA	NA	0.008	1,900	50	110	1,980	502	
MW-129R*	06/27/18	0.5	U	NA	NA	0.008	47	50	100	99	553	
MW-129R*	09/17/18	0.5	U	NA	NA	0.008	81	38	110	174	545	
MW-129R*	11/28/18	0.5	U	NA	NA	0.008	550	32	130	712	509	
MW-129R*	02/07/19	0.03	U	NA	NA	0.008	46	33	100	129	553	
MW-134X	06/28/12	NA	U	NA	NA	NA	28	50	66	72	575	
MW-134X	12/14/12	0.2	U	NA	NA	0.008	30	50	210	265	518	
MW-134X	06/27/13	NA	U	NA	NA	NA	30	50	71	126	540	
MW-134X	12/19/13	0.2	U	NA	NA	0.008	29	50	68	74	573	
MW-134X	06/17/14	NA	U	NA	NA	NA	28	50	66	72	575	
MW-134X	12/10/14	0.2	U	NA	NA	0.008	28	50	66	72	575	
MW-134X	06/24/15	NA	U	NA	NA	NA	29	50	68	74	573	
MW-135*	10/27/08	0.50	U	0.50	U	1.00	0.007	243	50	485	389	512
MW-135*	12/15/08	0.5	U	0.5	U	1.00	0.007	238	50	476	382	513
MW-135*	02/27/09	0.5	U	NA	U	NA	0.079	800	50	870	1,695	503
MW-135*	04/24/09	0.5	U	NA	U	NA	0.007	310	50	67	369	513
MW-135*	06/29/09	0.5	U	NA	U	NA	0.007	1,600	50	1,000	2,625	502
MW-135*	08/24/09	0.5	U	NA	U	NA	0.012	1,900	50	640	2,565	502
MW-135*	10/29/09	0.5	U	NA	U	NA	0.012	2,000	50	520	2,545	502
MW-135*	01/21/10	NA	U	NA	U	NA	NA	460	50	360	845	506
MW-135*	04/23/10	NA	U	NA	U	NA	NA	610	50	400	1,035	505
MW-135*	07/22/10	NA	U	NA	U	NA	NA	1,400	50	200	1,625	503
MW-135*	11/01/10	0.5	U	NA	U	NA	0.012	1,800	50	590	2,415	502
MW-135*	03/24/11	NA	U	NA	U	NA	NA	500	50	170	695	507
MW-135*	06/17/11	NA	U	NA	U	NA	NA	550	50	210	785	506
MW-135*	03/28/14	NA	U	NA	U	NA	NA	28	50	66	72	575
MW-135*	09/28/11	NA	U	NA	U	NA	NA	29	50	69	74	573
MW-135*	12/16/11	0.2	U	NA	U	NA	0.007	79	50	110	214	523
MW-135*	03/28/12	NA	U	NA	U	NA	NA	29	50	67	73	574
MW-135*	07/02/12	NA	U	NA	U	NA	NA	29	50	68	74	573
MW-135*	09/28/12	NA	U	NA	U	NA	NA	30	50	69	75	572
MW-135*	12/19/12	0.2	U	NA	U	NA	0.008	28	50	66	72	575
MW-135*	03/28/13	NA	U	NA	U	NA	NA	30	50	71	76	571
MW-135*	06/28/13	NA	U	NA	U	NA	NA	30	50	70	75	571
MW-135*	09/26/13	NA	U	NA	U	NA	NA	30	50	70	75	571
MW-135*	12/20/13	0.2	U	NA	U	NA	0.008	29	50	68	74	573
MW-135*	03/28/14	NA	U	NA	U	NA	NA	29	50	67	73	574
MW-135*	06/20/14	NA	U	NA	U	NA	NA	29	50	68	74	573
MW-135*	10/02/14	NA	U	NA	U	NA	NA	35	50	82	84	563
MW-135*	12/12/14	0.2	U	NA	U	NA	0.008	29	50	67	73	574
MW-135*	03/26/15	NA	U	NA	U	NA	NA	29	50	67	73	574
MW-135*	06/26/15	NA	U	NA	U	NA	NA	28	50	66	72	575
MW-136*	10/27/08	0.50	U	0.50	U	1.00	0.008	243	50	485	389	512
MW-136*	12/15/08	0.50	U	0.50	U	1.00	0.007	243	60.6	485	425	528
MW-136*	02/27/09	2.5	U	NA	U	NA	0.007	2,400	120	490	3,010	508
MW-136*	04/24/09	1.9	U	NA	U	NA	0.009	1,400	52	170	1,622	506
MW-136*	06/29/09	0.8	U	NA	U	NA	0.008	2,500	50	1,200	3,725	501
MW-136*	08/24/09	0.6	U	NA	U	NA	0.012	1,600	50	560	2,185	502
MW-136*	10/29/09	0.5	U	NA	U	NA	0.013	2,100	50	460	2,585	502
MW-136*	01/21/10	NA	U	NA	U	NA	NA	980	50	540	1,545	503
MW-136*	04/23/10	NA	U	NA	U	NA	NA	1,100	50	410	1,535	503
MW-136*	07/22/10	NA	U	NA	U	NA	NA	1,300	50	250	1,575	503

Table 3-4  
 Summary of Groundwater Analytical Data  
 Petroleum and Polynuclear Aromatic Hydrocarbons  
 Former Unocal Edmonds Bulk Fuel Terminal  
 11720 Unoco Road  
 Edmonds, Washington

Monitoring Well	Date Sampled	BTEX <sup>1</sup> (µg/L)				Total cPAHs Adjusted for Toxicity <sup>2</sup> (µg/L)		Diesel <sup>3</sup> (µg/L)	Gasoline <sup>4</sup> (µg/L)	Heavy Oil <sup>3</sup> (µg/L)	TPH <sup>5</sup> (µg/L)	TPH CUL <sup>6</sup> (µg/L)			
		B	T	E	X										
		CUL=16	--	--	--	CUL=0.05	--								
MW-136*	11/01/10	0.5	U	NA	NA	NA	NA	0.012	UU	1,200	50	U	460	1,685	503
MW-136*	03/24/11	NA		NA	NA	NA	NA	NA		540	50	U	78	643	507
MW-136*	06/17/11	NA		NA	NA	NA	NA	NA		510	50	U	110	645	507
MW-136*	09/28/11	NA		NA	NA	NA	NA	NA		40	50	U	67	99	553
MW-136*	12/16/11	0.2	U	NA	NA	NA	NA	0.007	UU	40	50	U	71	101	551
MW-136*	03/29/12	NA		NA	NA	NA	NA	NA		570	50	U	240	835	506
MW-136*	07/03/12	NA		NA	NA	NA	NA	NA		31	U	50	U	77	UU
MW-136*	09/28/12	NA		NA	NA	NA	NA	NA		29	U	50	U	67	UU
MW-136*	12/19/12	0.2	U	NA	NA	NA	NA	0.008	UU	30	U	50	U	69	UU
MW-136*	03/28/13	NA		NA	NA	NA	NA	NA		28	U	50	U	66	UU
MW-136*	06/28/13	NA		NA	NA	NA	NA	NA		28	U	50	U	66	UU
MW-136*	09/26/13	NA		NA	NA	NA	NA	NA		42	U	50	U	68	UU
MW-136* (Duplicate)	09/26/13	NA		NA	NA	NA	NA	NA		29	U	50	U	68	UU
MW-136*	12/20/13	0.2	U	NA	NA	NA	NA	0.008	UU	32	U	50	U	74	UU
MW-136*	03/28/14	NA		NA	NA	NA	NA	NA		29	U	50	U	67	UU
MW-136*	06/20/14	NA		NA	NA	NA	NA	NA		28	U	50	U	66	UU
MW-136* (Duplicate)	06/20/14	NA		NA	NA	NA	NA	NA		28	U	50	U	66	UU
MW-136*	10/02/14	NA		NA	NA	NA	NA	NA		32	U	50	U	75	UU
MW-136* (Duplicate)	10/02/14	NA		NA	NA	NA	NA	NA		33	U	51	U	96	UU
MW-136*	12/12/14	0.2	U	NA	NA	NA	NA	0.011	UU	30	U	50	U	70	UU
MW-136* (Duplicate)	12/12/14	0.2	U	NA	NA	NA	NA	0.008	UU	29	U	50	U	68	UU
MW-136*	03/26/15	NA		NA	NA	NA	NA	NA		29	U	50	U	68	UU
MW-136*	06/26/15	NA		NA	NA	NA	NA	NA		28	U	50	U	66	UU
MW-139R*	10/22/08	0.50	U	0.50	U	0.724	U	1.00	U	240	U	57	JZ	481	U
MW-139R*	12/10/08	0.50	U	0.50	U	0.50	U	1.00	U	248	U	50	U	495	U
MW-139R*	02/25/09	0.5	U	NA	NA	NA	NA	0.008	UU	42	U	50	U	73	UU
MW-139R*	04/23/09	0.5	U	NA	NA	NA	NA	0.008	UU	31	U	50	U	72	UU
MW-139R*	06/25/09	0.5	U	NA	NA	NA	NA	0.007	UU	63	U	50	U	69	UU
MW-139R*	08/20/09	0.5	U	NA	NA	NA	NA	0.012	UU	87	U	50	U	66	UU
MW-139R*	10/28/09	0.5	U	NA	NA	NA	NA	0.012	UU	78	U	50	U	70	UU
MW-139R*	01/20/10	NA		NA	NA	NA	NA	NA		31	U	50	U	70	UU
MW-139R* (Duplicate)	01/20/10	NA		NA	NA	NA	NA	NA		36	U	50	U	70	UU
MW-139R*	04/21/10	NA		NA	NA	NA	NA	NA		34	U	50	U	78	UU
MW-139R*	07/21/10	NA		NA	NA	NA	NA	NA		66	U	50	U	80	UU
MW-139R*	10/28/10	0.5	U	NA	NA	NA	NA	0.012	UU	64	U	50	U	66	UU
MW-139R*	03/23/11	NA		NA	NA	NA	NA	NA		29	U	50	U	67	UU
MW-139R*	06/16/11	NA		NA	NA	NA	NA	NA		56	U	50	U	870	UU
MW-139R*	09/27/11	NA		NA	NA	NA	NA	NA		29	U	50	U	67	UU
MW-139R*	12/15/11	0.2	U	NA	NA	NA	NA	0.007	UU	29	U	50	U	67	UU
MW-139R*	03/28/12	NA		NA	NA	NA	NA	NA		28	U	50	U	66	UU
MW-139R*	06/29/12	NA		NA	NA	NA	NA	NA		31	U	50	U	72	UU
MW-139R*	09/27/12	NA		NA	NA	NA	NA	NA		31	U	50	U	73	UU
MW-139R*	12/18/12	0.2	U	NA	NA	NA	NA	0.008	UU	29	U	50	U	68	UU
MW-139R* (Duplicate)	12/18/12	0.2	U	NA	NA	NA	NA	0.008	UU	29	U	50	U	68	UU
MW-139R*	03/27/13	NA		NA	NA	NA	NA	NA		31	U	50	U	72	UU
MW-139R*	06/27/13	NA		NA	NA	NA	NA	NA		31	U	50	U	72	UU
MW-139R*	09/26/13	NA		NA	NA	NA	NA	NA		30	U	50	U	70	UU
MW-139R*	12/18/13	0.2	U	NA	NA	NA	NA	0.008	UU	30	U	50	U	71	UU
MW-139R*	03/28/14	NA		NA	NA	NA	NA	NA		28	U	50	U	66	UU
MW-139R*	06/19/14	NA		NA	NA	NA	NA	NA		29	U	50	U	68	UU
MW-139R*	10/01/14	NA		NA	NA	NA	NA	NA		29	U	50	U	67	UU
MW-139R*	12/10/14	0.2	U	NA	NA	NA	NA	0.008	UU	28	U	50	U	66	UU
MW-139R*	03/25/15	NA		NA	NA	NA	NA	NA		29	U	50	U	67	UU
MW-139R*	06/25/15	NA		NA	NA	NA	NA	NA		28	U	50	U	66	UU
MW-139R*	10/25/16	0.5	U	0.5	U	0.5	U	1.5	U	45	U	50	U	100	UU

Table 3-4  
 Summary of Groundwater Analytical Data  
 Petroleum and Polynuclear Aromatic Hydrocarbons  
 Former Unocal Edmonds Bulk Fuel Terminal  
 11720 Unoco Road  
 Edmonds, Washington

Monitoring Well	Date Sampled	BTEX <sup>1</sup> (µg/L)				Total cPAHs Adjusted for Toxicity <sup>2</sup> (µg/L)		Diesel <sup>3</sup> (µg/L)	Gasoline <sup>4</sup> (µg/L)	Heavy Oil <sup>3</sup> (µg/L)	TPH <sup>5</sup> (µg/L)	TPH CUL <sup>6</sup> (µg/L)								
		B	T	E	X															
		CUL=16	--	--	--	CUL=0.05	--													
MW-139R* (Duplicate)	10/25/16	0.5	U	0.5	U	0.5	U	1.5	U	0.008	UU	46	U	50	U	100	U	98	UU	553
MW-139R*	07/27/17	0.5	U	NA	U	NA	U	NA	U	0.008	UU	47	U	50	U	100	U	99	UU	553
MW-139R*	03/22/18	0.5	U	NA	U	NA	U	NA	U	0.008	UU	47	U	50	U	100	U	99	UU	553
MW-139R*	06/28/18	0.5	U	NA	U	NA	U	NA	U	0.008	UU	47	U	50	U	100	U	99	UU	553
MW-139R*	09/19/18	0.5	U	NA	U	NA	U	NA	U	0.008	UU	47	U	19	U	110	U	88	UU	521
MW-139R*	11/28/18	0.5	U	NA	U	NA	U	NA	U	0.008	UU	47	U	19	U	100	U	83	UU	522
MW-13U	06/28/12	NA	U	NA	U	NA	U	NA	U	NA	UU	29	U	50	U	67	U	73	UU	574
MW-13U	12/14/12	0.2	U	NA	U	NA	U	NA	U	0.008	UU	29	U	50	U	67	U	73	UU	574
MW-13U	06/27/13	NA	U	NA	U	NA	U	NA	U	NA	UU	30	U	50	U	69	U	75	UU	572
MW-13U	12/20/13	0.2	U	NA	U	NA	U	NA	U	0.008	UU	31	U	50	U	71	U	76	UU	570
MW-13U (Duplicate)	12/20/13	0.2	U	NA	U	NA	U	NA	U	0.008	UU	30	U	50	U	70	U	75	UU	571
MW-13U	06/17/14	NA	U	NA	U	NA	U	NA	U	NA	UU	29	U	50	U	68	U	74	UU	573
MW-13U	12/10/14	0.2	U	NA	U	NA	U	NA	U	0.008	UU	30	U	50	U	69	U	75	UU	572
MW-13U	06/24/15	NA	U	NA	U	NA	U	NA	U	NA	UU	29	U	50	U	68	U	74	UU	573
MW-143	10/22/08	0.50	U	0.50	U	0.50	U	1.00	U	0.007	UU	250	U	50	U	500	U	400	UU	512
MW-143	12/16/08	0.50	U	0.50	U	0.50	U	1.00	U	0.007	UU	240	U	50	U	481	U	386	UU	512
MW-143	02/25/09	0.5	U	NA	U	NA	U	NA	U	0.007	UU	1,400	U	50	U	580	U	2,005	UU	502
MW-143	04/21/09	0.5	U	NA	U	NA	U	NA	U	0.007	UU	710	U	50	U	69	U	770	UU	506
MW-143	06/24/09	0.5	U	NA	U	NA	U	NA	U	0.007	UU	940	U	50	U	210	U	1,175	UU	504
MW-143	08/19/09	0.5	U	NA	U	NA	U	NA	U	0.013	UU	360	U	50	U	71	U	421	UU	511
MW-143	10/27/09	0.5	U	NA	U	NA	U	NA	U	0.013	UU	200	U	50	U	66	U	258	UU	519
MW-143	01/21/10	NA	U	NA	U	NA	U	NA	U	NA	UU	620	U	50	U	330	U	975	UU	505
MW-143	04/20/10	NA	U	NA	U	NA	U	NA	U	NA	UU	1,200	U	50	U	340	U	1,565	UU	503
MW-143 (Duplicate)	04/20/10	NA	U	NA	U	NA	U	NA	U	NA	UU	1,400	U	50	U	450	U	1,875	UU	503
MW-143	07/20/10	NA	U	NA	U	NA	U	NA	U	NA	UU	1,300	U	50	U	260	U	1,585	UU	503
MW-143	10/27/10	0.5	U	NA	U	NA	U	NA	U	0.012	UU	110	U	50	U	67	U	169	UU	529
MW-143	06/15/11	NA	U	NA	U	NA	U	NA	U	NA	UU	1,500	U	50	U	220	U	1,745	UU	503
MW-143	12/14/11	0.2	U	NA	U	NA	U	NA	U	0.007	UU	31	U	50	U	67	U	90	UU	559
MW-143	06/29/12	NA	U	NA	U	NA	U	NA	U	NA	UU	31	U	50	U	73	U	77	UU	569
MW-143	12/20/12	0.2	U	NA	U	NA	U	NA	U	0.008	UU	28	U	50	U	66	U	72	UU	575
MW-143	06/27/13	0.2	U	NA	U	NA	U	NA	U	NA	UU	29	U	50	U	68	U	74	UU	573
MW-143	12/18/13	0.2	U	NA	U	NA	U	NA	U	0.008	UU	28	U	50	U	66	U	72	UU	575
MW-143 (Duplicate)	12/18/13	0.2	U	NA	U	NA	U	NA	U	0.008	UU	28	U	50	U	66	U	72	UU	575
MW-143	06/18/14	NA	U	NA	U	NA	U	NA	U	NA	UU	29	U	50	U	67	U	73	UU	574
MW-143	12/10/14	0.2	U	NA	U	NA	U	NA	U	0.008	UU	28	U	50	U	65	U	72	UU	575
MW-143	06/23/15	NA	U	NA	U	NA	U	NA	U	NA	UU	30	U	50	U	69	U	75	UU	572
MW-143	10/25/16	0.5	U	0.5	U	0.5	U	1.5	U	0.023	UU	47	U	50	U	100	U	99	UU	553
MW-143	07/25/17	0.5	U	NA	U	NA	U	NA	U	0.008	UU	46	U	50	U	100	U	98	UU	553
MW-143	03/22/18	0.5	U	NA	U	NA	U	NA	U	0.008	UU	46	U	50	U	100	U	98	UU	553
MW-143	06/29/18	0.5	U	NA	U	NA	U	NA	U	0.008	UU	46	U	50	U	100	U	98	UU	553
MW-143	09/18/18	0.5	U	NA	U	NA	U	NA	U	0.008	UU	48	U	19	U	110	U	89	UU	521
MW-143	11/30/18	0.5	U	NA	U	NA	U	NA	U	0.008	UU	45	U	19	U	100	U	82	UU	523
MW-147*	10/21/08	0.50	U	0.50	U	0.50	U	1.00	U	0.007	UU	240	U	91.2	U	481	U	452	UU	541
MW-147*	12/09/08	0.50	U	0.562	U	1.38	U	3.49	U	0.008	UU	243	U	604	U	485	U	968	UU	653
MW-147*	02/23/09	0.5	U	NA	U	NA	U	NA	U	0.007	UU	1,100	U	760	U	380.00	U	2,240	UU	573
MW-147* (Duplicate)	02/23/09	0.5	U	NA	U	NA	U	NA	U	0.008	UU	1,000	U	790	U	420	U	2,210	UU	577
MW-147*	04/21/09	1.7	U	NA	U	NA	U	NA	U	0.008	UU	730	U	630	U	99	U	1,459	UU	597
MW-147*	06/23/09	0.5	U	NA	U	NA	U	NA	U	0.007	UU	750	U	260	U	290	U	1,300	UU	541
MW-147*	08/18/09	0.5	U	NA	U	NA	U	NA	U	0.012	UU	240	U	76	U	70	U	351	UU	544
MW-147*	10/26/09	0.5	U	NA	U	NA	U	NA	U	0.012	UU	1,700	U	690	U	330	U	2,720	UU	553
MW-147*	01/19/10	NA	U	NA	U	NA	U	NA	U	NA	UU	360	U	750	U	66	U	1,143	UU	663
MW-147*	04/20/10	NA	U	NA	U	NA	U	NA	U	NA	UU	320	U	730	U	78	U	1,128	UU	660
MW-147*	07/20/10	NA	U	NA	U	NA	U	NA	U	NA	UU	500	U	70	U	100	U	670	UU	520
MW-147*	10/26/10	0.5	U	NA	U	NA	U	NA	U	0.013	UU	1,200	U	330	U	200	U	1,730	UU	539
MW-147*	03/22/11	NA	U	NA	U	NA	U	NA	U	NA	UU	750	U	740	U	68	U	1,524	UU	611



Table 3-4  
 Summary of Groundwater Analytical Data  
 Petroleum and Polynuclear Aromatic Hydrocarbons  
 Former Unocal Edmonds Bulk Fuel Terminal  
 11720 Unoco Road  
 Edmonds, Washington

Monitoring Well	Date Sampled	BTEX <sup>1</sup> (µg/L)				Total cPAHs Adjusted for Toxicity <sup>2</sup> (µg/L)		Diesel <sup>3</sup> (µg/L)	Gasoline <sup>4</sup> (µg/L)	Heavy Oil <sup>3</sup> (µg/L)	TPH <sup>5</sup> (µg/L)	TPH CUL <sup>6</sup> (µg/L)				
		B	T	E	X	CUL=0.05										
		CUL=16	--	--	--	CUL=0.05										
MW-147*	06/15/11	NA	NA	NA	NA	NA	NA	370	250	67	U	654	584			
MW-147*	09/27/11	NA	NA	NA	NA	NA	NA	29	U	50	U	73	UU	574		
MW-147*	12/13/11	0.2	U	NA	NA	NA	0.007	UU	28	U	50	U	72	UU	575	
MW-147* (Duplicate)	12/13/11	0.2	U	NA	NA	NA	0.007	UU	28	U	50	U	72	UU	575	
MW-147*	03/28/12	NA		NA	NA	NA	NA	29	U	130	U	178		689		
MW-147*	06/28/12	NA		NA	NA	NA	NA	29	U	59	U	107		630		
MW-147*	09/26/12	NA		NA	NA	NA	NA	30	U	50	U	76	UU	571		
MW-147*	12/14/12	0.2	U	NA	NA	NA	0.008	UU	28	U	50	U	72	UU	575	
MW-147*	03/26/13	NA		NA	NA	NA	NA	28	U	50	U	72	UU	575		
MW-147*	06/25/13	NA		NA	NA	NA	NA	30	U	50	U	76	UU	571		
MW-147*	09/25/13	NA		NA	NA	NA	NA	29	U	50	U	74	UU	573		
MW-147*	12/17/13	0.2	U	NA	NA	NA	0.008	UU	29	U	50	U	73	UU	574	
MW-147*	03/28/14	NA		NA	NA	NA	NA	31	U	50	U	77	UU	570		
MW-147*	06/18/14	NA		NA	NA	NA	NA	29	U	50	U	73	UU	574		
MW-147*	09/30/14	NA		NA	NA	NA	NA	30	U	50	U	76	UU	571		
MW-147*	12/09/14	0.2	U	NA	NA	NA	0.008	UU	29	U	50	U	73	UU	574	
MW-147*	03/25/15	NA		NA	NA	NA	NA	30	U	50	U	75	UU	572		
MW-147* (Duplicate)	03/25/15	NA		NA	NA	NA	NA	28	U	50	U	72	UU	575		
MW-147*	06/23/15	NA		NA	NA	NA	NA	28	U	50	U	72	UU	575		
MW-149R*	10/21/08	0.50	U	0.50	U	0.50	U	1.00	U	245	U	490	U	393	UU	512
MW-149R*	12/09/08	0.50	U	0.50	U	0.50	U	1.00	U	243	U	485	U	389	UU	512
MW-149R*	02/23/09	0.5	U	NA		NA		NA		110	U	78	U	174		528
MW-149R*	04/21/09	0.5	U	NA		NA		NA		100	U	76	U	163		531
MW-149R*	06/23/09	0.5	U	NA		NA		NA		190	U	66	U	248		520
MW-149R*	08/18/09	0.5	U	NA		NA		NA		160	U	66	U	218		522
MW-149R*	10/26/09	0.5	U	NA		NA		NA		430	U	320		775		506
MW-149R*	01/19/10	NA		NA		NA		NA		28	U	66	U	72	UU	575
MW-149R*	04/20/10	NA		NA		NA		NA		29	U	68	U	74	UU	573
MW-149R* (Duplicate)	04/20/10	NA		NA		NA		NA		28	U	66	U	72	UU	575
MW-149R*	07/20/10	NA		NA		NA		NA		210	U	89		324		515
MW-149R*	10/26/10	0.5	U	NA		NA		0.012	UU	410	U	210		645		507
MW-149R*	03/22/11	NA		NA		NA		NA		61	U	66	U	119		543
MW-149R*	06/17/11	NA		NA		NA		NA		82	U	66	U	140		536
MW-149R*	09/27/11	NA		NA		NA		NA		30	U	67	U	74	UU	573
MW-149R*	12/13/11	0.2	U	NA		NA		0.007	UU	29	U	68	U	74	UU	573
MW-149R*	03/28/12	NA		NA		NA		NA		28	U	66	U	72	UU	575
MW-149R* (Duplicate)	03/28/12	NA		NA		NA		NA		29	U	67	U	73	UU	574
MW-149R*	06/28/12	NA		NA		NA		NA		250	U	66	U	308		516
MW-149R*	09/26/12	NA		NA		NA		NA		32	U	74	U	78	UU	568
MW-149R*	12/14/12	0.2	U	NA		NA		0.008	UU	28	U	66	U	72	UU	575
MW-149R*	03/26/13	NA		NA		NA		NA		32	U	74	U	78	UU	568
MW-149R*	06/25/13	NA		NA		NA		NA		29	U	68	U	74	UU	573
MW-149R*	09/24/13	NA		NA		NA		NA		29	U	68	U	74	UU	573
MW-149R*	12/17/13	0.2	U	NA		NA		0.008	UU	30	U	71	U	76	UU	571
MW-149R*	03/28/14	NA		NA		NA		NA		29	U	68	U	74	UU	573
MW-149R*	06/18/14	NA		NA		NA		NA		28	U	66	U	72	UU	575
MW-149R*	09/30/14	NA		NA		NA		NA		30	U	70	U	75	UU	571
MW-149R*	12/09/14	0.2	U	NA		NA		0.008	UU	30	U	70	U	75	UU	571
MW-149R*	03/25/15	NA		NA		NA		NA		29	U	68	U	74	UU	573
MW-149R*	06/23/15	NA		NA		NA		NA		29	U	68	U	74	UU	573
MW-150*	10/21/08	0.50	U	0.50	U	0.50	U	1.00	U	240	U	481	UJ	626		508
MW-150*	12/09/08	0.50	U	0.50	U	0.50	U	1.00	U	248	U	495	U	397	UU	512
MW-150*	02/23/09	0.5	U	NA		NA		NA		82	U	69	U	142		535
MW-150*	04/21/09	0.5	U	NA		NA		NA		240	U	69	U	300		516
MW-150*	06/23/09	0.5	U	NA		NA		0.008	UU	160	U	69	U	220		522

Table 3-4  
 Summary of Groundwater Analytical Data  
 Petroleum and Polynuclear Aromatic Hydrocarbons  
 Former Unocal Edmonds Bulk Fuel Terminal  
 11720 Unoco Road  
 Edmonds, Washington

Monitoring Well	Date Sampled	BTEX <sup>1</sup> (µg/L)				Total cPAHs Adjusted for Toxicity <sup>2</sup> (µg/L)		Diesel <sup>3</sup> (µg/L)	Gasoline <sup>4</sup> (µg/L)	Heavy Oil <sup>3</sup> (µg/L)	TPH <sup>5</sup> (µg/L)	TPH CUL <sup>6</sup> (µg/L)						
		B	T	E	X													
		CUL=16	--	--	--	CUL=0.05	--											
MW-150*	08/18/09	0.5	U	NA	NA	NA	0.013	UU	110	50	U	72	U	171	529			
MW-150*	10/26/09	0.5	U	NA	NA	NA	0.012	UU	420	50	U	270	U	715	507			
MW-150*	01/19/10	NA		NA	NA	NA	NA		31	50	U	69	U	91	558			
MW-150*	04/20/10	NA		NA	NA	NA	NA		48	50	U	77	U	112	546			
MW-150*	07/20/10	NA		NA	NA	NA	NA		200	50	U	68	U	259	519			
MW-150*	10/26/10	0.5	U	NA	NA	NA	0.012	UU	59	50	U	65	U	117	544			
MW-150*	03/22/11	NA		NA	NA	NA	NA		29	U	50	U	67	U	73	UU		
MW-150*	06/17/11	NA		NA	NA	NA	NA		190	U	50	U	68	U	249	520		
MW-150*	09/27/11	NA		NA	NA	NA	NA		30	U	50	U	68	U	74	UU		
MW-150*	12/13/11	0.2	U	NA	NA	NA	0.007	UU	29	U	50	U	68	U	74	UU		
MW-150* (Duplicate)	12/13/11	0.2	U	NA	NA	NA	0.007	UU	28	U	50	U	66	U	72	UU		
MW-150*	03/28/12	NA		NA	NA	NA	NA		29	U	50	U	67	U	73	UU		
MW-150*	06/28/12	NA		NA	NA	NA	NA		29	U	50	U	68	U	74	UU		
MW-150*	09/26/12	NA		NA	NA	NA	NA		29	U	50	U	68	U	74	UU		
MW-150*	12/14/12	0.2	U	NA	NA	NA	0.008	UU	30	U	50	U	69	U	75	UU		
MW-150*	03/26/13	NA		NA	NA	NA	NA		28	U	50	U	66	U	72	UU		
MW-150*	06/25/13	NA		NA	NA	NA	NA		30	U	50	U	69	U	75	UU		
MW-150*	09/26/13	NA		NA	NA	NA	NA		30	U	50	U	69	U	75	UU		
MW-150*	12/17/13	0.2	U	NA	NA	NA	0.008	UU	30	U	50	U	70	U	75	UU		
MW-150*	03/28/14	NA		NA	NA	NA	NA		28	U	50	U	66	U	72	UU		
MW-150*	06/18/14	NA		NA	NA	NA	NA		29	U	50	U	67	U	73	UU		
MW-150*	09/30/14	NA		NA	NA	NA	NA		31	U	50	U	71	U	76	UU		
MW-150* (Duplicate)	09/30/14	NA		NA	NA	NA	NA		30	U	50	U	71	U	76	UU		
MW-150*	12/09/14	0.4	U	NA	NA	NA	0.008	UU	28	U	50	U	66	U	72	UU		
MW-150* (Duplicate)	12/09/14	0.2	U	NA	NA	NA	0.008	UU	30	U	50	U	70	U	75	UU		
MW-150*	03/25/15	NA		NA	NA	NA	NA		29	U	50	U	67	U	73	UU		
MW-150*	06/23/15	NA		NA	NA	NA	NA		28	U	50	U	66	U	72	UU		
MW-203	06/28/12	NA		NA	NA	NA	NA		29	U	50	U	68	U	74	UU		
MW-203	12/17/12	0.2	U	NA	NA	NA	0.008	UU	31	U	50	U	72	U	77	UU		
MW-203	06/27/13	NA		NA	NA	NA	NA		29	U	50	U	67	U	73	UU		
MW-203	12/19/13	0.2	U	NA	NA	NA	0.008	UU	30	U	50	U	70	U	75	UU		
MW-203	06/18/14	NA		NA	NA	NA	NA		30	U	50	U	70	U	75	UU		
MW-203	12/10/14	0.3		NA	NA	NA	0.008	UU	28	U	50	U	65	U	72	UU		
MW-203	06/24/15	NA		NA	NA	NA	NA		28	U	50	U	66	U	72	UU		
MW-20R*	10/22/08	2.95		0.50	U	3.31	1.00	U	0.008	UU	250	U	222	U	500	U	597	
MW-20R*	12/10/08	22.2		0.50	U	2.06	1.14	U	0.007	UU	248	U	325	U	495	U	697	
MW-20R*	02/24/09	55		NA		NA	NA		0.007	UU	580		420		87		1,087	
MW-20R*	04/22/09	47		NA		NA	NA		0.008	UU	510		270		86		866	
MW-20R*	06/24/09	0.5	U	NA		NA	NA		0.007	UU	160	U	50	U	69	U	220	
MW-20R*	08/19/09	8.4		NA		NA	NA		0.012	UU	220	U	50	U	68	U	279	
MW-20R*	10/27/09	4.9		NA		NA	NA		0.013	UU	170	U	50	U	72	U	231	
MW-20R*	01/19/10	50		0.5	U	1.1	1.5	U	NA		260		66	U	66	U	359	
MW-20R*	04/21/10	0.9		NA		NA	NA		NA		350	U	50	U	100		475	
MW-20R*	07/20/10	0.5		0.5	U	0.5	U	U	NA		130	U	50	U	66	U	188	
MW-20R* (Duplicate)	07/20/10	0.5		0.5	U	0.5	U	U	NA		130	U	50	U	66	U	188	
MW-20R*	10/27/10	0.5	U	NA		NA	NA		0.012	UU	47	U	50	U	75	U	110	
MW-20R*	03/23/11	5.3		NA		NA	NA		NA		390	U	50	U	190		605	
MW-20R*	06/15/11	3.9		NA		NA	NA		NA		320		71		72		463	
MW-20R*	09/27/11	0.9		NA		NA	NA		NA		29	U	50	U	68	U	74	UU
MW-20R*	12/14/11	20		NA		NA	NA		0.007	UU	29	U	65	U	67	U	113	
MW-20R*	03/28/12	28		NA		NA	NA		NA		29	U	120	U	67	U	168	
MW-20R*	06/28/12	0.3		NA		NA	NA		NA		29	U	50	U	68	U	74	UU
MW-20R*	09/26/12	2.2		NA		NA	NA		NA		30	U	57	U	70	U	107	
MW-20R*	12/17/12	0.2	U	NA		NA	NA		0.008	UU	28	U	50	U	66	U	72	UU
MW-20R*	03/26/13	3.7		NA		NA	NA		NA		29	U	310	U	68	U	359	

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 Summary of Groundwater Analytical Data  
 Petroleum and Polynuclear Aromatic Hydrocarbons  
 Former Unocal Edmonds Bulk Fuel Terminal  
 11720 Unoco Road  
 Edmonds, Washington

Monitoring Well	Date Sampled	BTEX <sup>1</sup> (µg/L)				Total cPAHs Adjusted for Toxicity <sup>2</sup> (µg/L)	Diesel <sup>3</sup> (µg/L)	Gasoline <sup>4</sup> (µg/L)	Heavy Oil <sup>3</sup> (µg/L)	TPH <sup>5</sup> (µg/L)	TPH CUL <sup>6</sup> (µg/L)
		B	T	E	X						
		CUL=16	--	--	--						
MW-20R*	06/25/13	1.1	NA	NA	NA	NA	29	69	67	117	642
MW-20R*	09/25/13	0.5 U	0.5 U	0.5 U	1.5 U	NA	31 U	50 U	72 U	77 UU	570
MW-20R* (Duplicate)	09/25/13	NA	NA	NA	NA	NA	30 U	50 U	69 U	75 UU	572
MW-20R*	12/18/13	35	NA	NA	NA	0.008 UU	30 U	82 U	70 U	132	652
MW-20R*	03/26/14	38	NA	NA	NA	NA	29 U	210 U	67 U	258	720
MW-20R*	06/18/14	0.7	NA	NA	NA	NA	28 U	98 U	66 U	145	670
MW-20R*	10/01/14	0.8	NA	NA	NA	NA	32 U	50 U	74 U	78 UU	568
MW-20R*	12/10/14	0.8	NA	NA	NA	0.008 UU	30 U	50 U	69 U	75 UU	572
MW-20R*	03/24/15	0.4	NA	NA	NA	NA	31 U	88 U	71 U	139	656
MW-20R*	06/24/15	NA	NA	NA	NA	NA	28 U	50 U	66 U	72 UU	575
MW-20R*	10/25/16	0.5 U	0.5 U	0.5 U	1.5 U	0.008 UU	45 U	50 U	100 U	98 UU	553
MW-20R*	07/26/17	1.6	NA	NA	NA	0.008 UU	46 U	64 U	100 U	137	606
MW-20R*	03/22/18	0.5 U	NA	NA	NA	0.008 UU	46 U	50 U	100 U	98 UU	553
MW-20R*	06/29/18	0.5 U	NA	NA	NA	0.008 UU	45 U	50 U	100 U	98 UU	553
MW-20R*	09/18/18	0.5 U	NA	NA	NA	0.008 UU	50 U	19 U	110 U	90 UU	521
MW-20R*	11/29/18	0.5 U	NA	NA	NA	0.008 UU	46 U	19 U	100 U	83 UU	523
MW-20R* (Duplicate)	11/29/18	0.5 U	NA	NA	NA	0.008 UU	45 U	19 U	100 U	82 UU	523
MW-500*	10/27/08	0.8	0.50 U	0.93	8.29	0.007 UU	1,180	298	472 U	1,714	535
MW-500*	12/15/08	0.5 U	0.50 U	0.50 U	1.00 U	0.007 UU	245 U	50 U	490 U	393 UU	512
MW-500*	02/27/09	0.5 U	NA	NA	NA	0.008 UU	250	50 U	320	595	508
MW-500*	04/24/09	0.5 U	NA	NA	NA	0.007 UU	44	50 U	76 U	107	548
MW-500* (Duplicate)	04/24/09	0.5 U	NA	NA	NA	0.008 UU	35	50 U	75 U	98	553
MW-500*	06/29/09	0.5 U	NA	NA	NA	0.008 UU	1,400	50 U	500	1,925	502
MW-500*	08/21/09	0.6	NA	NA	NA	0.012 UU	2,200	110	690	3,000	507
MW-500*	10/29/09	0.5 U	NA	NA	NA	0.012 UU	1,000	50 U	500	1,525	503
MW-500*	01/21/10	NA	NA	NA	NA	NA	36	50 U	70	131	539
MW-500* (Duplicate)	01/21/10	NA	NA	NA	NA	NA	29 U	50 U	69 U	74 UU	573
MW-500*	04/22/10	NA	NA	NA	NA	NA	59	50 U	68 U	118	543
MW-500*	07/22/10	NA	NA	NA	NA	NA	490	50 U	96	611	508
MW-500*	11/01/10	0.5 U	NA	NA	NA	0.012 UU	170	50 U	67 U	229	521
MW-500*	03/24/11	NA	NA	NA	NA	NA	32	50 U	68 U	91	557
MW-500*	06/17/11	NA	NA	NA	NA	NA	130	50 U	67 U	189	526
MW-500*	09/28/11	NA	NA	NA	NA	NA	61	60	69 U	156	585
MW-500* (Duplicate)	09/28/11	NA	NA	NA	NA	NA	45	62	98 U	156	588
MW-500*	12/16/11	0.2 U	NA	NA	NA	0.008 UU	28 U	50 U	66 U	72 UU	575
MW-500*	03/28/12	NA	NA	NA	NA	NA	28 U	50 U	66 U	72 UU	575
MW-500*	07/02/12	NA	NA	NA	NA	NA	29 U	50 U	69 U	74 UU	573
MW-500*	09/28/12	NA	NA	NA	NA	NA	230	80	150	460	535
MW-500*	12/19/12	0.2 U	NA	NA	NA	0.008 UU	28 U	50 U	66 U	72 UU	575
MW-500*	03/28/13	NA	NA	NA	NA	NA	28 U	50 U	66 U	72 UU	575
MW-500*	06/28/13	NA	NA	NA	NA	NA	29 U	57 U	67 U	77 UU	581
MW-500*	09/26/13	NA	NA	NA	NA	NA	41	50 U	70 U	101	551
MW-500*	12/20/13	0.2 U	NA	NA	NA	0.008 UU	30 U	50 U	69 U	75 UU	572
MW-500*	03/28/14	NA	NA	NA	NA	NA	29 U	50 U	67 U	73 UU	574
MW-500*	06/19/14	NA	NA	NA	NA	NA	29 U	72 U	67 U	120	645
MW-500*	10/01/14	NA	NA	NA	NA	NA	130	65	83	278	548
MW-500*	12/11/14	0.2 U	NA	NA	NA	0.008 UU	29 U	50 U	67 U	73 UU	574
MW-500*	03/26/15	NA	NA	NA	NA	NA	28 U	50 U	66 U	72 UU	575
MW-500*	06/26/15	NA	NA	NA	NA	NA	83	93	66 U	209	600
MW-501*	10/24/08	0.50 U	1.42 U	1.15	1.00 U	0.008 UU	6,690 J	1,040	597 J	8,327	525
MW-501*	12/15/08	0.50 U	0.50 U	0.50 U	1.00 U	0.007 UU	243 U	50 U	485 U	389 UU	512
MW-501*	03/02/09	0.5 U	NA	NA	NA	0.008 UU	630	50.00 U	160	815	506
MW-501*	03/02/09	5.0 U	NA	NA	NA	0.008 UU	550	50.00 U	210	785	506
MW-501*	04/24/09	0.5 U	NA	NA	NA	0.007 UU	350	50 U	67	442	511
MW-501*	06/26/09	0.5 U	NA	NA	NA	0.007 UU	1,700	50 U	1,100	2,825	502

Table 3-4  
 Summary of Groundwater Analytical Data  
 Petroleum and Polynuclear Aromatic Hydrocarbons  
 Former Unocal Edmonds Bulk Fuel Terminal  
 11720 Unoco Road  
 Edmonds, Washington

Monitoring Well	Date Sampled	BTEX <sup>1</sup> (µg/L)				Total cPAHs Adjusted for Toxicity <sup>2</sup> (µg/L)		Diesel <sup>3</sup> (µg/L)	Gasoline <sup>4</sup> (µg/L)	Heavy Oil <sup>3</sup> (µg/L)	TPH <sup>5</sup> (µg/L)	TPH CUL <sup>6</sup> (µg/L)					
		B	T	E	X												
		CUL=16	--	--	--	CUL=0.05	--										
MW-501*	08/21/09	0.5	U	NA	NA	NA	0.013	UU	2,600	50	U	760	3,385	501			
MW-501*	10/29/09	0.5	U	NA	NA	NA	0.013	UU	75	50	U	73	137	537			
MW-501*	01/21/10	NA		NA	NA	NA	NA		75	50	U	67	134	538			
MW-501*	04/22/10	NA		NA	NA	NA	NA		130	50	U	69	190	526			
MW-501*	07/22/10	NA		NA	NA	NA	NA		470	50	U	97	592	508			
MW-501*	11/01/10	0.5	U	NA	NA	NA	0.013	UU	230	50	U	68	289	517			
MW-501*	03/24/11	NA		NA	NA	NA	NA		89	50	U	67	148	534			
MW-501*	06/17/11	NA		NA	NA	NA	NA		340	50	U	82	447	511			
MW-501*	09/28/11	NA		NA	NA	NA	NA		30	U	U	67	74	UU	573		
MW-501*	12/16/11	0.2	U	NA	NA	NA	0.007	UU	28	U	U	66	72	UU	575		
MW-501*	03/28/12	NA		NA	NA	NA	NA		29	U	U	67	73	UU	574		
MW-501*	07/02/12	NA		NA	NA	NA	NA		31	U	U	73	77	UU	569		
MW-501*	09/28/12	NA		NA	NA	NA	NA		29	U	U	67	73	UU	574		
MW-501*	12/19/12	0.2	U	NA	NA	NA	0.008	UU	54	50	U	67	113	545			
MW-501*	03/28/13	NA		NA	NA	NA	NA		30	U	U	70	75	UU	571		
MW-501*	06/27/13	NA		NA	NA	NA	NA		30	U	U	70	75	UU	571		
MW-501*	09/26/13	NA		NA	NA	NA	NA		30	U	U	71	76	UU	571		
MW-501*	12/20/13	0.2	U	NA	NA	NA	0.008	UU	29	U	U	67	73	UU	574		
MW-501*	03/28/14	NA		NA	NA	NA	NA		29	U	U	67	73	UU	574		
MW-501*	06/19/14	NA		NA	NA	NA	NA		29	U	U	67	73	UU	574		
MW-501*	10/01/14	NA		NA	NA	NA	NA		30	U	U	71	76	UU	571		
MW-501*	12/11/14	0.2	U	NA	NA	NA	0.008	UU	28	U	U	66	72	UU	575		
MW-501*	03/26/15	NA		NA	NA	NA	NA		29	U	U	68	74	UU	573		
MW-501*	06/26/15	NA		NA	NA	NA	NA		28	U	U	66	72	UU	575		
MW-502	10/24/08	0.50	U	0.50	U	0.891	1.00	U	0.008	UU	347	JZ	500	U	1,697	661	
MW-502	12/12/08	0.50	U	0.50	U	0.50	1.00	U	0.008	UU	321	JX	874	U	1,438	648	
MW-502	02/25/09	0.5	U	NA	NA	NA	NA	U	0.008	UU	31	U	1,500	U	1,552	784	
MW-502	04/22/09	0.5	U	NA	NA	NA	NA	U	0.071	UU	370	U	1,100	U	1,503	689	
MW-502	06/26/09	0.5	U	NA	NA	NA	NA	U	0.007	UU	260	U	170	U	512	571	
MW-502 (Duplicate)	06/26/09	0.5	U	NA	NA	NA	NA	U	0.007	UU	220	U	160	U	413	585	
MW-502	08/21/09	0.5	U	NA	NA	NA	NA	U	0.012	UU	140	U	67	U	199	525	
MW-502	10/28/09	0.5	U	NA	NA	NA	NA	U	0.012	UU	370	U	470	U	873	626	
MW-502	01/21/10	NA		NA	NA	NA	NA		NA		300	U	800	U	1,230	661	
MW-502	04/22/10	NA		NA	NA	NA	NA		NA		290	U	520	U	844	650	
MW-502	07/21/10	NA		NA	NA	NA	NA		NA		200	U	50	U	259	519	
MW-502	10/28/10	0.5	U	NA	NA	NA	NA		0.013	UU	98	U	50	U	161	531	
MW-502	06/17/11	NA		NA	NA	NA	NA		NA		150	U	50	U	209	524	
MW-502	12/16/11	0.2	U	NA	NA	NA	NA		0.007	UU	30	U	50	U	88	560	
MW-502	07/02/12	NA		NA	NA	NA	NA		NA		29	U	50	U	74	UU	573
MW-502	12/19/12	0.2	U	NA	NA	NA	NA		0.008	UU	95	U	180	U	309	640	
MW-502 (Duplicate)	12/19/12	0.2	U	NA	NA	NA	NA		0.008	UU	95	U	190	U	318	644	
MW-502	06/26/13	NA		NA	NA	NA	NA		NA		29	U	50	U	73	UU	574
MW-502	12/20/13	0.2	U	NA	NA	NA	NA		0.008	UU	30	U	50	U	75	UU	571
MW-502	06/19/14	NA		NA	NA	NA	NA		NA		29	U	50	U	74	UU	573
MW-502	12/11/14	0.2	U	NA	NA	NA	NA		0.008	UU	29	U	50	U	74	UU	573
MW-502	06/25/15	NA		NA	NA	NA	NA		NA		28	U	50	U	72	UU	575
MW-502	10/25/16	0.5	U	0.5	U	0.5	1.5	U	0.008	UU	46	U	50	U	98	UU	553
MW-502	07/26/17	0.5	U	NA	NA	NA	NA	U	0.008	UU	47	U	50	U	99	UU	553
MW-502 (Duplicate)	07/26/17	0.5	U	NA	NA	NA	NA	U	0.008	UU	46	U	50	U	98	UU	553
MW-502	03/21/18	0.2	U	NA	NA	NA	NA		0.008	UU	48	U	50	U	104	UU	550
MW-502	06/27/18	0.5	U	NA	NA	NA	NA		0.008	UU	50	U	50	U	105	UU	549
MW-502	09/20/18	0.5	U	NA	NA	NA	NA		0.008	UU	47	U	19	U	88	UU	521
MW-502	11/28/18	0.5	U	NA	NA	NA	NA		0.008	UU	45	U	19	U	82	UU	523
MW-503	10/27/08	0.50	U	0.50	U	0.50	1.00	U	0.007	UU	236	U	472	U	379	UU	513
MW-503	12/12/08	0.50	U	0.50	U	0.50	1.00	U	0.007	UU	243	U	485	U	389	UU	512

Table 3-4  
 Summary of Groundwater Analytical Data  
 Petroleum and Polynuclear Aromatic Hydrocarbons  
 Former Unocal Edmonds Bulk Fuel Terminal  
 11720 Unoco Road  
 Edmonds, Washington

Monitoring Well	Date Sampled	BTEX <sup>1</sup> (µg/L)				Total cPAHs Adjusted for Toxicity <sup>2</sup> (µg/L)		Diesel <sup>3</sup> (µg/L)	Gasoline <sup>4</sup> (µg/L)	Heavy Oil <sup>3</sup> (µg/L)	TPH <sup>5</sup> (µg/L)	TPH CUL <sup>6</sup> (µg/L)					
		B	T	E	X												
		CUL=16	--	--	--	CUL=0.05	--										
MW-503	02/26/09	0.5	U	NA	NA	NA	0.008	UU	77	50	U	74	U	139		536	
MW-503	04/22/09	0.5	U	NA	NA	NA	0.007	UU	130	50	U	68	U	189		526	
MW-503	06/26/09	0.5	U	NA	NA	NA	0.007	UU	210	50	U	96	U	331		515	
MW-503	08/21/09	0.5	U	NA	NA	NA	0.012	UU	140	50	U	67	U	199		525	
MW-503	10/28/09	0.5	U	NA	NA	NA	0.012	UU	160	50	U	66	U	218		522	
MW-503	01/21/10	NA		NA	NA	NA	NA		150	50	U	190		365		513	
MW-503	04/22/10	NA		NA	NA	NA	NA		30	U	50	U	70	UU		571	
MW-503	07/21/10	NA		NA	NA	NA	NA		220		50	U	68	U		517	
MW-503	10/28/10	0.5	U	NA	NA	NA	0.013	UU	150		50	U	79			519	
MW-503	06/17/11	NA		NA	NA	NA	NA		140		50	U	67	U		525	
MW-503 (Duplicate)	06/17/11	NA		NA	NA	NA	NA		160		50	U	67	U		522	
MW-503	12/15/11	0.2	U	NA	NA	NA	0.007	UU	28	U	50	U	66	UU		575	
MW-503	07/02/12	NA		NA	NA	NA	NA		29	U	50	U	69	UU		573	
MW-503	12/18/12	0.2	U	NA	NA	NA	0.008	UU	29	U	50	U	67	UU		574	
MW-503	06/27/13	NA		NA	NA	NA	NA		30	U	50	U	70	UU		571	
MW-503	12/19/13	0.2	U	NA	NA	NA	0.008	UU	29	U	50	U	67	UU		574	
MW-503	06/19/14	NA		NA	NA	NA	NA		29	U	50	U	67	UU		574	
MW-503	12/11/14	0.2	U	NA	NA	NA	0.008		29	U	50	U	68	UU		573	
MW-503	06/25/15	NA		NA	NA	NA	NA		31	U	50	U	72	UU		570	
MW-503	10/25/16	0.5	U	0.5	U	0.5	0.008	UU	47	U	50	U	100	UU		553	
MW-503	03/21/18	0.2	U	NA	NA	NA	0.008	UU	48	U	50	U	110	UU		550	
MW-503	06/28/18	0.5	U	NA	NA	NA	0.008	UU	48	U	50	U	110	UU		550	
MW-503 (Duplicate)	06/28/18	0.5	U	NA	NA	NA	0.008	UU	49	U	50	U	110	UU		549	
MW-503	09/20/18	0.5	U	NA	NA	NA	0.008	UU	47	U	19	U	100	UU		522	
MW-503	11/28/18	0.5	U	NA	NA	NA	0.008	UU	46	U	19	U	100	UU		523	
MW-504	10/24/08	7.03		0.50	U	4.03	2.95	UU	248	U	329	U	495	U	701		607
MW-504	12/12/08	0.5	U	0.5	U	0.5	1.00	UU	248	U	50	U	495	U	397	UU	512
MW-504 (Duplicate)	12/12/08	5	U	5	U	5	1.00	UU	250	U	50	U	500	U	400	UU	512
MW-504	02/27/09	0.5	U	NA	NA	NA	0.007	UU	30	U	50	U	70	UU		571	
MW-504	04/24/09	0.5	U	NA	NA	NA	0.007	UU	46		50	U	66	U	104		550
MW-504	06/26/09	0.5	U	NA	NA	NA	0.007	UU	220		50	U	73	U	282		517
MW-504	08/21/09	0.5	U	NA	NA	NA	0.012	UU	220		50	U	68	U	279		517
MW-504	10/28/09	0.5	U	NA	NA	NA	0.012	UU	95		50	U	66	U	153		533
MW-504	01/21/10	NA		NA	NA	NA	NA		28	U	50	U	66	UU		575	
MW-504	04/22/10	NA		NA	NA	NA	NA		29	U	50	U	67	UU		574	
MW-504	07/21/10	NA		NA	NA	NA	NA		110		50	U	75	U	173		529
MW-504	10/28/10	0.5	U	NA	NA	NA	0.012	UU	110		50	U	66	U	168		530
MW-504	06/17/11	NA		NA	NA	NA	NA		60		50	U	68	U	119		543
MW-504	12/16/11	0.2	U	NA	NA	NA	0.007	UU	28	U	50	U	66	UU		575	
MW-504 (Duplicate)	12/16/11	0.2	U	NA	NA	NA	0.007		29	U	50	U	68	UU		573	
MW-504	07/02/12	NA		NA	NA	NA	NA		30	U	50	U	69	UU		572	
MW-504	12/18/12	0.2	U	NA	NA	NA	0.008	UU	29	U	50	U	68	UU		573	
MW-504	06/27/13	NA		NA	NA	NA	NA		29	U	50	U	68	UU		573	
MW-504 (Duplicate)	06/27/13	NA		NA	NA	NA	NA		29	U	50	U	68	UU		573	
MW-504	12/19/13	0.2	U	NA	NA	NA	0.008	UU	28	U	78		66	U	125		653
MW-504	06/19/14	NA		NA	NA	NA	NA		29	U	50	U	68	UU		573	
MW-504	12/11/14	0.2	U	NA	NA	NA	0.008	UU	29	U	50	U	68	UU		573	
MW-504	06/25/15	NA		NA	NA	NA	NA		28	U	50	U	66	UU		575	
MW-504	10/25/16	0.5	U	0.5	U	0.5	0.008	UU	47	U	50	U	100	UU		553	
MW-504	07/26/17	0.5	U	NA	NA	NA	0.008	UU	46	U	50	U	100	UU		553	
MW-504	03/21/18	0.2	U	NA	NA	NA	0.008	UU	46	U	50	U	100	UU		553	
MW-504	06/28/18	0.5	U	NA	NA	NA	0.008	UU	47	U	50	U	100	UU		553	
MW-504	09/20/18	0.5	U	NA	NA	NA	0.008	UU	51	U	19	U	110	UU		521	
MW-504	11/28/18	0.5	U	NA	NA	NA	0.008	UU	46	U	19	U	100	UU		523	
MW-505	10/24/08	0.5	U	0.5	UU	0.50	1.01	UU	253	U	50	U	505	U	404	UU	512

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 Petroleum and Polynuclear Aromatic Hydrocarbons  
 Former Unocal Edmonds Bulk Fuel Terminal  
 11720 Unoco Road  
 Edmonds, Washington

Monitoring Well	Date Sampled	BTEX <sup>1</sup> (µg/L)								Total cPAHs Adjusted for Toxicity <sup>2</sup> (µg/L)		Diesel <sup>3</sup> (µg/L)		Gasoline <sup>4</sup> (µg/L)		Heavy Oil <sup>3</sup> (µg/L)		TPH <sup>5</sup> (µg/L)		TPH CUL <sup>6</sup> (µg/L)
		B		T		E		X		CUL=0.05		--		--		--		see note 6		
		CUL=16		--		--		--												
MW-505 (Duplicate)	10/24/08	5.0	U	5.0	U	2.78		1.00	U	0.007	UU	250	U	50	U	500	U	400	UU	512
MW-505	12/15/08	0.5	U	0.5	U	0.50	U	1.00	U	0.007	UU	238	U	50	U	476	U	382	UU	513
MW-505 (Duplicate)	12/15/08	5.0	U	5.0	U	0.647	U	1.00	U	0.007	UU	238	U	50	U	476	U	382	UU	513
MW-505	02/27/09	0.5	U	NA		NA		NA		0.008	UU	52		50	U	78	U	116		544
MW-505	04/22/09	0.5	U	NA		NA		NA		0.008		59		50	U	67	U	118		543
MW-505	06/26/09	0.5	U	NA		NA		NA		0.007	UU	39		50	U	100		164		530
MW-505	08/21/09	0.5	U	NA		NA		NA		0.013	UU	98		50	U	75	U	161		531
MW-505	10/28/09	0.5	U	NA		NA		NA		0.012	UU	67		50	U	69	U	127		540
MW-505	01/20/10	NA		NA		NA		NA		NA		30	U	50	U	71	U	76	UU	571
MW-505	04/22/10	NA		NA		NA		NA		NA		30	U	50	U	69	U	75	UU	572
MW-505	07/21/10	NA		NA		NA		NA		NA		220		50	U	67	U	279		517
MW-505	10/29/10	0.5	U	NA		NA		NA		0.013	UU	130		50	U	74	U	192		526
MW-505	06/17/11	NA		NA		NA		NA		NA		100		50	U	67	U	159		531
MW-505	12/15/11	0.2	U	NA		NA		NA		0.007	UU	29	U	50	U	67	U	73	UU	574
MW-505	07/02/12	NA		NA		NA		NA		NA		31	U	50	U	73	U	77	UU	569
MW-505 (Duplicate)	07/02/12	NA		NA		NA		NA		NA		32		50	U	75	U	95		555
MW-505	12/18/12	0.2	U	NA		NA		NA		0.008	UU	31	U	50	U	71	U	76	UU	570
MW-505	06/27/13	NA		NA		NA		NA		NA		30	U	50	U	70	U	75	UU	571
MW-505	12/19/13	0.2	U	NA		NA		NA		0.008	UU	28	U	50	U	66	U	72	UU	575
MW-505	06/19/14	NA		NA		NA		NA		NA		29	U	50	U	67	U	73	UU	574
MW-505	12/11/14	0.2	U	NA		NA		NA		0.009		29	U	50	U	67	U	73	UU	574
MW-505	06/25/15	NA		NA		NA		NA		NA		31	U	50	U	72	U	77	UU	570
MW-505	10/25/16	0.5	U	0.5	U	0.5	U	1.5	U	0.008	UU	45	U	50	U	100	U	98	UU	553
MW-505 (Duplicate)	10/25/16	0.5	U	0.5	U	0.5	U	1.5	U	0.008	UU	46	U	50	U	100	U	98	UU	553
MW-505	07/26/17	0.5	U	NA		NA		NA		0.008	UU	45	U	50	U	100	U	98	UU	553
MW-505	03/21/18	0.2	U	NA		NA		NA		0.008	UU	47	U	50	U	100	U	99	UU	553
MW-505	06/28/18	0.5	U	NA		NA		NA		0.008	UU	46	U	50	U	100	U	98	UU	553
MW-505	09/20/18	0.5	U	NA		NA		NA		0.008	UU	47	U	19	U	100	U	83	UU	522
MW-505 (Duplicate)	09/20/18	0.5	U	NA		NA		NA		0.008	UU	46	U	19	U	100	U	83	UU	523
MW-505	11/28/18	0.5	U	NA		NA		NA		0.008	UU	48	U	19	U	110	U	89	UU	521
MW-506	10/24/08	0.50	U	0.50	U	0.50	U	1.00	U	0.007	UU	245	U	50	U	490	U	393	UU	512
MW-506	12/12/08	0.50	U	0.50	U	0.50	U	1.00	U	0.007	UU	248	U	50	U	495	U	397	UU	512
MW-506	02/27/09	0.5	U	NA		NA		NA		0.007	UU	37		50	U	70	U	97		553
MW-506	04/24/09	0.5	U	NA		NA		NA		0.008	UU	31	U	50	U	72	U	77	UU	570
MW-506	06/26/09	0.5	U	NA		NA		NA		0.007	UU	38		50	U	140		203		524
MW-506	08/21/09	0.5	U	NA		NA		NA		0.013	UU	85		50	U	75	U	148		534
MW-506	10/30/09	0.5	U	NA		NA		NA		0.016	UU	50		50	U	74	U	112		546
MW-506	01/21/10	NA		NA		NA		NA		NA		28	U	50	U	66	U	72	UU	575
MW-506	04/22/10	NA		NA		NA		NA		NA		36		50	U	75	U	99		553
MW-506	07/21/10	NA		NA		NA		NA		NA		57		50	U	68	U	116		544
MW-506	10/29/10	0.50	U	NA		NA		NA		0.012	UU	97		50	U	72	U	158		532
MW-506 (Duplicate)	10/29/10	0.5	U	NA		NA		NA		0.012	UU	72		50	U	71	U	133		538
MW-506	06/16/11	NA		NA		NA		NA		NA		50		50	U	67	U	109		547
MW-506	12/15/11	0.2	U	NA		NA		NA		0.007	UU	29	U	50	U	67	U	73	UU	574
MW-506	06/29/12	NA		NA		NA		NA		NA		30	U	50	U	70	U	75	UU	571
MW-506	12/19/12	0.2	U	NA		NA		NA		0.008	UU	29	U	50	U	67	U	73	UU	574
MW-506	06/27/12	NA		NA		NA		NA		NA		29	U	50	U	67	U	73	UU	574
MW-506	12/19/13	0.2	U	NA		NA		NA		0.008	UU	28	U	50	U	66	U	72	UU	575
MW-506 (Duplicate)	12/19/13	0.2	U	NA		NA		NA		0.008	UU	28	U	50	U	60	U	69	UU	579
MW-506	06/19/14	NA		NA		NA		NA		NA		29	U	50	U	67	U	73	UU	574
MW-506	12/11/14	0.2	U	NA		NA		NA		0.008	UU	29	U	50	U	67	U	73	UU	574
MW-506	06/25/15	NA		NA		NA		NA		NA		28	U	50	U	66	U	72	UU	575
MW-506	10/25/16	0.5	U	0.5	U	0.5	U	1.5	U	0.008	UU	46	U	50	U	100	U	98	UU	553
MW-506	07/27/17	0.5	U	NA		NA		NA		0.008	UU	46	U	50	U	100	U	98	UU	553
MW-506	03/21/18	0.2	U	NA		NA		NA		0.008	UU	46	U	50	U	100	U	98	UU	553
MW-506 (Duplicate)	03/21/18	0.2	U	NA		NA		NA		0.008	UU	46	U	50	U	100	U	98	UU	553

Table 3-4  
 Summary of Groundwater Analytical Data  
 Petroleum and Polynuclear Aromatic Hydrocarbons  
 Former Unocal Edmonds Bulk Fuel Terminal  
 11720 Unoco Road  
 Edmonds, Washington

Monitoring Well	Date Sampled	BTEX <sup>1</sup> (µg/L)				Total cPAHs Adjusted for Toxicity <sup>2</sup> (µg/L)		Diesel <sup>3</sup> (µg/L)	Gasoline <sup>4</sup> (µg/L)	Heavy Oil <sup>3</sup> (µg/L)	TPH <sup>5</sup> (µg/L)	TPH CUL <sup>6</sup> (µg/L)						
		B	T	E	X													
		CUL=16	--	--	--	CUL=0.05	--											
MW-506	06/28/18	0.5	U	NA	NA	NA	NA	0.008	UU	47	U	50	U	100	U	99	UU	553
MW-506	09/19/18	0.5	U	NA	NA	NA	NA	0.008	UU	46	U	19	U	100	U	83	UU	523
MW-506	11/28/18	0.5	U	NA	NA	NA	NA	0.008	UU	46	U	19	U	100	U	83	UU	523
MW-507	10/24/08	0.995		0.50	U	0.50	U	1.00	U	240	U	523		481	U	884		643
MW-507	12/12/08	0.605		0.50	U	0.50	U	1.00	U	245	U	194		490	U	562		574
MW-507	02/27/09	0.5	U	NA		NA		NA		610		120		310		1,040		523
MW-507 (Duplicate)	02/27/09	5	U	NA		NA		NA		560		130		120		810		532
MW-507	04/24/09	0.5	U	NA		NA		NA		520		59	U	74	U	616		519
MW-507	06/26/09	0.5	U	NA		NA		NA		640		62		440		1,142		510
MW-507	08/21/09	0.5	U	NA		NA		NA		450		54		69	U	539		520
MW-507 (Duplicate)	08/21/09	0.5	U	NA		NA		NA		500		50	U	72	U	561		508
MW-507	10/28/09	0.5	U	NA		NA		NA		900		50	U	88		1,013		505
MW-507	01/21/10	NA		NA		NA		NA		270		50	U	88		383		513
MW-507	04/22/10	NA		NA		NA		NA		290		50	U	91		406		512
MW-507	07/21/10	NA		NA		NA		NA		330		50	U	80		435		511
MW-507	10/29/10	0.5	U	NA		NA		NA		370		50	U	220		615		508
MW-507	06/17/11	NA		NA		NA		NA		200		50	U	88		313		515
MW-507	12/16/11	0.2	U	NA		NA		NA		28	U	50	U	66	U	72	UU	575
MW-507 (Duplicate)	12/16/11	0.2	U	NA		NA		NA		29	U	50	U	67	U	73	UU	574
MW-507	06/29/12	NA		NA		NA		NA		29	U	50	U	67	U	73	UU	574
MW-507	12/19/12	0.2	U	NA		NA		NA		28	U	50	U	66	U	72	UU	575
MW-507	06/27/13	NA		NA		NA		NA		29	U	50	U	68	U	74	UU	573
MW-507	12/19/13	0.2	U	NA		NA		NA		28	U	50	U	66	U	72	UU	575
MW-507	06/19/14	NA		NA		NA		NA		28	U	50	U	66	U	72	UU	575
MW-507	12/11/14	0.2	U	NA		NA		NA		29	U	50	U	68	U	74	UU	573
MW-507	06/25/15	NA		NA		NA		NA		28	U	50	U	66	U	72	UU	575
MW-507	10/25/16	0.5	U	0.5	U	0.5	U	1.5	U	46	U	50	U	100	U	98	UU	553
MW-507	07/27/17	0.5	U	NA		NA		NA		46	U	50	U	100	U	98	UU	553
MW-507 (Duplicate)	07/27/17	0.5	U	NA		NA		NA		46	U	50	U	100	U	98	UU	553
MW-507	03/21/18	0.2	U	NA		NA		NA		47	U	50	U	100	U	99	UU	553
MW-507	06/28/18	0.5	U	NA		NA		NA		46	U	50	U	100	U	98	UU	553
MW-507	09/19/18	0.5	U	NA		NA		NA		48	U	19	U	110	U	89	UU	521
MW-507 (Duplicate)	09/19/18	0.5	U	NA		NA		NA		49	U	19	U	110	U	89	UU	521
MW-507	11/28/18	0.5	U	NA		NA		NA		45	U	19	U	100	U	82	UU	523
MW-508	10/24/08	0.50	U	0.50	U	0.50	U	1.00	U	243	U	50	U	485	U	389	UU	512
MW-508	12/11/08	0.50	U	0.50	U	0.50	U	1.00	U	243	U	50	U	485	U	389	UU	512
MW-508	02/26/09	0.5	U	NA		NA		NA		85		50	U	74	U	147		534
MW-508	04/23/09	0.5	U	NA		NA		NA		90		50	U	70	U	150		533
MW-508	06/25/09	0.5	U	NA		NA		NA		430		50	U	290		745		506
MW-508 (Duplicate)	06/25/09	0.5	U	NA		NA		NA		310		50	U	310		645		507
MW-508	08/21/09	0.5	U	NA		NA		NA		200		50	U	67	U	259		519
MW-508	10/28/09	0.5	U	NA		NA		NA		71		50	U	67	U	130		539
MW-508 (Duplicate)	10/28/09	0.5	U	NA		NA		NA		68		50	U	70	U	128		540
MW-508	01/20/10	NA		NA		NA		NA		29	U	50	U	67	U	73	UU	574
MW-508 (Duplicate)	01/20/10	NA		NA		NA		NA		28	U	50	U	66	U	72	UU	575
MW-508	04/22/10	NA		NA		NA		NA		31	U	50	U	72	U	77	UU	570
MW-508	07/21/10	NA		NA		NA		NA		270		50	U	76	U	333		514
MW-508	10/28/10	0.5	U	NA		NA		NA		64		50	U	66	U	122		542
MW-508	06/16/11	NA		NA		NA		NA		150		50	U	67	U	209		524
MW-508	12/15/11	0.2	U	NA		NA		NA		29	U	50	U	67	U	73	UU	574
MW-508	06/29/12	NA		NA		NA		NA		29	U	50	U	67	U	73	UU	574
MW-508	12/19/12	0.2	U	NA		NA		NA		46		50	U	67	U	105		549
MW-508	06/27/13	NA		NA		NA		NA		29	U	50	U	67	U	73	UU	574
MW-508 (Duplicate)	06/27/13	NA		NA		NA		NA		29	U	50	U	67	U	73	UU	574
MW-508	12/19/13	0.2	U	NA		NA		NA		29	U	50	U	67	U	73	UU	574
MW-508	06/19/14	NA		NA		NA		NA		28	U	50	U	66	U	72	UU	575

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 Summary of Groundwater Analytical Data  
 Petroleum and Polynuclear Aromatic Hydrocarbons  
 Former Unocal Edmonds Bulk Fuel Terminal  
 11720 Unoco Road  
 Edmonds, Washington

Monitoring Well	Date Sampled	BTEX <sup>1</sup> (µg/L)				Total cPAHs Adjusted for Toxicity <sup>2</sup> (µg/L)		Diesel <sup>3</sup> (µg/L)	Gasoline <sup>4</sup> (µg/L)	Heavy Oil <sup>3</sup> (µg/L)	TPH <sup>5</sup> (µg/L)	TPH CUL <sup>6</sup> (µg/L)								
		B	T	E	X	CUL=0.05														
		CUL=16	--	--	--	--														
MW-508	12/11/14	0.2	U	NA	NA	NA	NA	0.008	UU	29	U	50	U	67	U	73	UU	574		
MW-508	06/25/15	NA		NA	NA	NA	NA	NA		28	U	50	U	66	U	72	UU	575		
MW-508	10/25/16	0.5	U	0.5	U	0.5	U	1.5	U	47	U	50	U	100	U	99	UU	553		
MW-508 <sup>DB2</sup>	07/27/17	0.5	U	NA		NA		NA		47	U	50	U	100	U	99	UU	553		
MW-509	10/23/08	0.50	U	0.50	U	0.50	U	1.00	U	0.007	UU	243	U	50	U	485	U	389	UU	512
MW-509	12/11/08	0.50	U	0.50	U	0.50	U	1.00	U	0.007	UU	243	U	50	U	485	U	389	UU	512
MW-509	02/25/09	0.5	U	NA		NA		NA		0.008	UU	32	U	50	U	75	U	79	UU	568
MW-509	04/23/09	0.5	U	NA		NA		NA		0.007	UU	31	U	50	U	71	U	76	UU	570
MW-509	06/25/09	0.5	U	NA		NA		NA		0.007	UU	29	U	50	U	68	U	88		560
MW-509	08/21/09	0.5	U	NA		NA		NA		0.012	UU	46	U	50	U	70	U	106		549
MW-509	10/28/09	0.5	U	NA		NA		NA		0.012	UU	48	U	50	U	76	U	111		546
MW-509	01/20/10	NA		NA		NA		NA		NA	U	28	U	50	U	66	U	72	UU	575
MW-509	04/21/10	NA		NA		NA		NA		NA		43	U	50	U	68	U	102		551
MW-509	07/21/10	NA		NA		NA		NA		NA		34	U	50	U	75	U	97		554
MW-509 (Duplicate)	07/21/10	NA		NA		NA		NA		NA		34	U	50	U	74	U	96		554
MW-509	10/28/10	0.5	U	NA		NA		NA		0.012	UU	40	U	50	U	76	U	103		550
MW-509	06/16/11	NA		NA		NA		NA		NA	U	29	U	50	U	67	U	73	UU	574
MW-509	12/15/11	0.2	U	NA		NA		NA		0.007	UU	29	U	50	U	67	U	73	UU	574
MW-509	06/29/12	NA		NA		NA		NA		NA	U	29	U	50	U	68	U	74	UU	573
MW-509	12/19/12	0.2	U	NA		NA		NA		0.008	UU	28	U	50	U	66	U	72	UU	575
MW-509	06/27/13	NA		NA		NA		NA		NA	U	29	U	50	U	67	U	73	UU	574
MW-509	12/19/13	0.2	U	NA		NA		NA		0.008	UU	28	U	50	U	66	U	72	UU	575
MW-509	06/19/14	NA		NA		NA		NA		NA	U	28	U	50	U	66	U	72	UU	575
MW-509 (Duplicate)	06/19/14	NA		NA		NA		NA		NA	U	28	U	50	U	66	U	72	UU	575
MW-509	12/11/14	0.2	U	NA		NA		NA		0.008	UU	28	U	50	U	66	U	72	UU	575
MW-509	06/25/15	NA		NA		NA		NA		NA	U	30	U	50	U	70	U	75	UU	571
MW-509 (Duplicate)	06/25/15	NA		NA		NA		NA		NA	U	31	U	50	U	72	U	77	UU	570
MW-509	10/25/16	0.5	U	0.5	U	0.5	U	1.5	U	0.008	UU	47	U	50	U	100	U	99	UU	553
MW-509	07/27/17	0.5	U	NA		NA		NA		0.008	UU	45	U	50	U	100	U	98	UU	553
MW-509	03/21/18	0.2	U	NA		NA		NA		0.008	UU	49	U	50	U	110	U	105	UU	549
MW-509	06/28/18	0.5	U	NA		NA		NA		0.008	UU	47	U	50	U	110	U	104	UU	550
MW-509	09/19/18	0.5	U	NA		NA		NA		0.008	UU	82	U	19	U	110	U	147		512
MW-509	11/28/18	0.5	U	NA		NA		NA		0.008	UU	46	U	19	U	100	U	83	UU	523
MW-510*	10/23/08	6.89		0.832		0.54		4.93		0.149	UU	3,400		332	JZ	495	U	3,980		516
MW-510*	12/11/08	5.44		0.50	U	0.50	U	3.98		0.075	UU	4,920		244		485	U	5,407		509
MW-510*	02/26/09	9.4		NA		NA		NA		0.032	UU	14,000		430		3,900	U	16,380		505
MW-510*	04/27/09	14		NA		NA		NA		0.007	UU	21,000		530		1,400		22,930		504
MW-510*	06/24/09	18		NA		NA		NA		0.015		22,000		490		2,600		25,090		504
MW-510*	08/20/09	8.4		NA		NA		NA		0.012	UU	16,000		430		3,300	U	18,080		504
MW-510*	10/28/09																			NA
MW-510*	01/19/10																			NA
MW-510*	04/20/10																			NA
MW-510*	07/19/10																			NA
MW-510*	10/25/10																			NA
MW-510*	03/22/11																			NA
MW-510*	06/20/11	NA		NA		NA		NA		NA		12,000		200		3,100		15,300		502
MW-510*	09/28/11																			NA
MW-510*	12/13/11																			NA
MW-510*	06/29/12																			NA
MW-510*	09/26/12																			NA
MW-510*	12/19/12	0.2	U	NA		NA		NA		0.078		1,300		69		390		1,759		507
MW-510*	03/27/13	NA		NA		NA		NA		NA		1,100		130		500		1,730		514
MW-510* (Duplicate)	03/27/13	NA		NA		NA		NA		NA		920		130		450		1,500		517
MW-510*	06/26/13	NA		NA		NA		NA		NA		1,000		180		440		1,620		522
MW-510*	09/24/13	NA		NA		NA		NA		NA		2,400		130		1,100		3,630		507



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 11720 Unoco Road  
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Monitoring Well	Date Sampled	BTEX <sup>1</sup> (µg/L)				Total cPAHs Adjusted for Toxicity <sup>2</sup> (µg/L)	Diesel <sup>3</sup> (µg/L)	Gasoline <sup>4</sup> (µg/L)	Heavy Oil <sup>3</sup> (µg/L)	TPH <sup>5</sup> (µg/L)	TPH CUL <sup>6</sup> (µg/L)							
		B	T	E	X													
		CUL=16	--	--	--													
MW-510*	12/18/13	0.2	U	NA	NA	NA	NA	0.029	UU	1,000	130	360	1,490	517				
MW-510*	03/26/14	NA		NA	NA	NA	NA	NA		4,400	140	1,600	6,140	504				
MW-510* (Duplicate)	03/26/14	NA		NA	NA	NA	NA	NA		3,300	160	1,300	4,760	506				
MW-510*	06/18/14	NA		NA	NA	NA	NA	NA		620	50	230	875	505				
MW-510*	09/30/14	NA		NA	NA	NA	NA	NA		4,000	50	1,800	5,825	501				
MW-510*	12/10/14	0.3		NA	NA	NA	NA	0.008	UU	180	50	130	335	514				
MW-510* (Duplicate)	12/10/14	0.2	U	NA	NA	NA	NA	0.008	UU	240	50	180	445	511				
MW-510*	03/24/15	NA		NA	NA	NA	NA	NA		250	50	95	370	513				
MW-510* (Duplicate)	03/24/15	NA		NA	NA	NA	NA	NA		240	50	150	415	512				
MW-510*	06/23/15	NA		NA	NA	NA	NA	NA		290	65	150	505	525				
MW-510*	10/26/16	0.5	U	0.5	U	0.5	U	1.5	U	1,500	82	900	2,482	506				
MW-510* <sup>DB2</sup>	07/26/17	0.5	U	NA		NA		NA		0.008	UU	46	86	100	U	159	627	
MW-511	10/24/08	0.50	U	0.50	U	0.50	U	1.00	U	0.008	UU	250	50	500	U	400	UU	512
MW-511	12/12/08	0.50	U	0.50	U	0.50	U	1.00	U	0.007	UU	243	50	485	U	389	UU	512
MW-511	02/25/09	0.5	U	NA		NA		NA		0.007	UU	30	50	70	U	75	UU	571
MW-511	04/21/09	0.5	U	NA		NA		NA		0.007	UU	28	50	66	U	72	UU	575
MW-511	06/24/09	0.5	U	NA		NA		NA		0.007	UU	28	50	66	U	72	UU	575
MW-511 (Duplicate)	06/24/09	0.5	U	NA		NA		NA		0.007	UU	28	50	66	U	72	UU	575
MW-511	08/19/09	0.5	U	NA		NA		NA		0.012	UU	32	50	74	U	94		555
MW-511	10/28/09	0.5	U	NA		NA		NA		0.012	UU	33	50	65	U	91		558
MW-511 (Duplicate)	10/28/09	0.5	U	NA		NA		NA		0.012	UU	28	50	65	U	72	UU	575
MW-511	01/20/10	NA		NA		NA		NA		NA		28	50	66	U	72	UU	575
MW-511	04/22/10	NA		NA		NA		NA		NA		32	50	75	U	79	UU	568
MW-511	07/22/10	NA		NA		NA		NA		NA		72	50	67	U	131		539
MW-511	10/28/10	0.5	U	NA		NA		NA		0.012	UU	36	50	67	U	95		555
MW-511	06/17/11	NA		NA		NA		NA		NA		100	50	70	U	160		531
MW-511	12/19/11	0.2	U	NA		NA		NA		0.007	UU	29	50	67	U	73	UU	574
MW-511	06/28/12	NA		NA		NA		NA		NA		30	50	69	U	75	UU	572
MW-511 (Duplicate)	06/28/12	NA		NA		NA		NA		NA		29	50	68	U	74	UU	573
MW-511	12/14/12	0.2	U	NA		NA		NA		0.008	UU	44	50	240		309		516
MW-511	06/27/13	NA		NA		NA		NA		NA		30	50	71	U	76	UU	571
MW-511	12/19/13	0.2	U	NA		NA		NA		0.008	UU	29	50	68	U	74	UU	573
MW-511 (Duplicate)	12/19/13	0.2	U	NA		NA		NA		0.008	UU	31	50	71	U	76	UU	570
MW-511	06/18/14	NA		NA		NA		NA		NA		29	50	67	U	73	UU	574
MW-511	12/10/14	0.3		NA		NA		NA		0.008	UU	29	50	68	U	74	UU	573
MW-511	03/25/15	NA		NA		NA		NA		NA		29	50	68	U	74	UU	573
MW-511	06/24/15	NA		NA		NA		NA		NA		28	50	66	U	72	UU	575
MW-511 (Duplicate)	06/24/15	NA		NA		NA		NA		NA		28	50	66	U	72	UU	575
MW-511	10/24/16	0.5	U	0.5	U	0.5	U	1.5	U	0.008	UU	45	50	100	U	98	UU	553
MW-511	07/27/17	0.5	U	NA		NA		NA		0.008	UU	46	50	100	U	98	UU	553
MW-511	03/21/18	0.2	U	NA		NA		NA		0.008	UU	46	50	100	U	98	UU	553
MW-511	06/27/18	0.5	U	NA		NA		NA		0.008	UU	46	50	100	U	98	UU	553
MW-511	09/20/18	0.5	U	NA		NA		NA		0.008	UU	46	19	100	U	83	UU	523
MW-511	11/29/18	0.5	U	NA		NA		NA		0.008	UU	45	19	100	U	82	UU	523
MW-512	10/23/08	1.97		0.50	U	2.96		5.23		0.008	UU	250	348	500	U	723		610
MW-512	12/11/08	2.5		0.50	U	2.17		3.58		0.007	UU	243	320	485	U	684		606
MW-512	02/25/09	1.5		NA		NA		NA		0.007	UU	390	280	78		748		582
MW-512	04/21/09	2.7		NA		NA		NA		0.007	UU	260	240	67	U	534		601
MW-512 (Duplicate)	04/21/09	3.7		NA		NA		NA		0.007	UU	220	280	66	U	533		623
MW-512	06/24/09	0.8		NA		NA		NA		0.007	UU	180	84	78		342		551
MW-512	08/19/08	1.3		NA		NA		NA		0.012	UU	220	110	66	U	363		564
MW-512	10/27/09	0.6		NA		NA		NA		0.012	UU	190	92	67	U	316		561
MW-512	01/20/10	NA		NA		NA		NA		NA		300	200	75		575		575
MW-512	04/21/10	NA		NA		NA		NA		NA		420	110	140		670		533
MW-512	07/21/10	NA		NA		NA		NA		NA		150	82	67	U	266		565

Table 3-4  
 Summary of Groundwater Analytical Data  
 Petroleum and Polynuclear Aromatic Hydrocarbons  
 Former Unocal Edmonds Bulk Fuel Terminal  
 11720 Unoco Road  
 Edmonds, Washington

Monitoring Well	Date Sampled	BTEX <sup>1</sup> (µg/L)				Total cPAHs Adjusted for Toxicity <sup>2</sup> (µg/L)		Diesel <sup>3</sup> (µg/L)	Gasoline <sup>4</sup> (µg/L)	Heavy Oil <sup>3</sup> (µg/L)	TPH <sup>5</sup> (µg/L)	TPH CUL <sup>6</sup> (µg/L)			
		B	T	E	X										
		CUL=16	--	--	--	CUL=0.05	--								
MW-512	10/28/10	0.5	U	NA	NA	NA	NA	0.012	UU	220	93	67	U	347	556
MW-512	06/16/11	NA		NA	NA	NA	NA	NA		200	74	67	U	308	550
MW-512 (Duplicate)	06/16/11	NA		NA	NA	NA	NA	NA		190	79	67	U	303	554
MW-512	12/15/11	0.40		NA	NA	NA	NA	0.007	UU	33	120	68	U	187	658
MW-512	06/29/12	NA		NA	NA	NA	NA	NA		57	190	68	U	281	670
MW-512	12/17/12	0.3		NA	NA	NA	NA	0.008	UU	32	120	67	U	186	660
MW-512	06/26/13	NA		NA	NA	NA	NA	NA		29	62	68	U	111	633
MW-512	12/18/13	0.2	U	NA	NA	NA	NA	0.008	UU	44	140	67	U	218	659
MW-512	06/17/14	NA		NA	NA	NA	NA	NA		48	110	68	U	192	637
MW-512	12/11/14	0.2	U	NA	NA	NA	NA	0.008		42	50	68	U	101	551
MW-512	06/24/15	NA		NA	NA	NA	NA	NA		31	58	66	U	122	608
MW-512	10/25/16	0.5	U	0.50	U	0.50	U	1.50	U	62	90	100	U	202	600
MW-512	07/26/17	0.5	U	NA		NA		NA		46	120	100	U	193	652
MW-512	03/21/18	0.2	U	NA		NA		NA		46	50	100	U	98	UU
MW-512 (Duplicate)	03/21/18	0.2	U	NA		NA		NA		46	50	100	U	98	UU
MW-512	06/28/18	0.5	U	NA		NA		NA		50	50	110	U	105	UU
MW-512 (Duplicate)	06/28/18	0.5	U	NA		NA		NA		49	50	110	U	105	UU
MW-512	09/20/18	0.5	U	NA		NA		NA		47	19	100	U	83	UU
MW-512	11/29/18	0.5	U	NA		NA		NA		46	19	100	U	83	UU
MW-513	10/23/08	0.702		0.50	U	0.50	U	3.81		245	564	490	U	932	647
MW-513	12/10/08	0.793		0.50	U	0.50	U	1.21		245	439	490	U	807	628
MW-513	02/25/09	0.5	U	NA		NA		NA		330	470	72.00	U	836	634
MW-513 (Duplicate)	02/25/09	5	U	NA		NA		NA		300	440	74.00	U	777	635
MW-513	04/22/09	0.5	U	NA		NA		NA		290	330	66	U	653	617
MW-513	06/24/09	0.5	U	NA		NA		NA		170	280	75	U	488	637
MW-513	08/20/09	0.5	U	NA		NA		NA		290	280	75	U	608	604
MW-513	10/27/09	0.5	U	NA		NA		NA		320	180	68	U	534	572
MW-513 (Duplicate)	10/27/09	5	U	NA		NA		NA		320	240	68	U	594	589
MW-513	01/20/10	NA		NA		NA		NA		300	210	67	U	544	585
MW-513	04/21/10	NA		NA		NA		NA		290	160	74	U	487	570
MW-513	07/21/10	NA		NA		NA		NA		360	140	67	U	534	555
MW-513	10/28/10	0.50	U	NA		NA		NA		270	150	74	U	457	570
MW-513 (Duplicate)	10/28/10	0.50	U	NA		NA		NA		290	160	67	U	484	571
MW-513	06/16/11	NA		NA		NA		NA		230	100	67	U	364	558
MW-513	12/15/11	0.3		NA		NA		NA		38	97	67	U	169	638
MW-513	06/29/12	NA		NA		NA		NA		62	59	75	U	159	581
MW-513	12/17/12	0.2	U	NA		NA		NA		28	65	66	U	112	639
MW-513	06/26/13	NA		NA		NA		NA		52	110	68	U	196	633
MW-513	12/18/13	0.2	U	NA		NA		NA		50	120	66	U	203	642
MW-513	06/17/14	NA		NA		NA		NA		47	72	67	U	153	608
MW-513	12/10/14	0.5	U	NA		NA		NA		52	50	66	U	110	547
MW-513	06/24/15	NA		NA		NA		NA		35	75	66	U	143	622
MW-513 (Duplicate)	06/24/15	NA		NA		NA		NA		45	50	65	U	103	550
MW-513	10/25/16	0.5	U	0.5	U	0.5	U	1.5	U	47	97	100	U	171	636
MW-513	07/25/17	0.5	U	NA		NA		NA		46	110	100	U	183	646
MW-513	03/21/18	0.2	U	NA		NA		NA		240	50	100	U	315	515
MW-513	06/28/18	0.5	U	NA		NA		NA		49	50	110	U	105	UU
MW-513	09/20/18	0.5	U	NA		NA		NA		46	19	100	HU	83	UU
MW-513	11/29/18	0.5	U	NA		NA		NA		47	19	110	U	88	UU
MW-514	10/23/08	2.98		0.64		1.54		4.69		253	1020	490	U	1,518	668
MW-514	12/10/08	3.15		0.84		1.82		4.98		248	801	495	U	1,173	672
MW-514 (Duplicate)	12/10/08	3.40		0.82		1.89		4.95		245	831	490	U	1,199	676
MW-514	02/24/09	2.9		NA		NA		NA		710	830	75	U	1,578	623
MW-514	04/21/09	3.5		NA		NA		NA		370	680	69	U	1,085	654
MW-514	06/24/09	2		NA		NA		NA		280	510	70	U	825	651
MW-514	08/19/09	3.2		NA		NA		NA		290	520	73	U	847	650

Table 3-4  
 Summary of Groundwater Analytical Data  
 Petroleum and Polynuclear Aromatic Hydrocarbons  
 Former Unocal Edmonds Bulk Fuel Terminal  
 11720 Unoco Road  
 Edmonds, Washington

Monitoring Well	Date Sampled	BTEX <sup>1</sup> (µg/L)				Total cPAHs Adjusted for Toxicity <sup>2</sup> (µg/L)		Diesel <sup>3</sup> (µg/L)	Gasoline <sup>4</sup> (µg/L)	Heavy Oil <sup>3</sup> (µg/L)	TPH <sup>5</sup> (µg/L)	TPH CUL <sup>6</sup> (µg/L)							
		B	T	E	X														
		CUL=16	--	--	--	CUL=0.05	--												
MW-514 (Duplicate)	08/19/09	2.7	NA	NA	NA	0.013	UU	270	450	70	U	755	644						
MW-514	10/27/09	2.2	NA	NA	NA	0.012	UU	400	400	66	U	833	610						
MW-514	01/20/10	NA	NA	NA	NA	NA		200	340	69	U	575	643						
MW-514	04/21/10	NA	NA	NA	NA	NA		340	270	71	U	646	593						
MW-514	07/21/10	NA	NA	NA	NA	NA		420	170	67	U	624	557						
MW-514	10/27/10	1.5	NA	NA	NA	0.012	UU	250	290	70	U	575	617						
MW-514	06/16/11	NA	NA	NA	NA	NA		230	170	67	U	434	586						
MW-514	12/14/11	0.5	NA	NA	NA	0.007	UU	39	150	67	U	223	669						
MW-514	06/29/12	NA	NA	NA	NA	NA		42	97	67	U	173	634						
MW-514	12/17/12	0.5	NA	NA	NA	0.008	UU	29	84	67	U	132	657						
MW-514 (Duplicate)	12/17/12	0.7	NA	NA	NA	0.008	UU	34	92	66	U	159	639						
MW-514	06/26/13	NA	NA	NA	NA	NA		31	140	71	U	207	670						
MW-514	12/18/13	0.2	U	NA	NA	0.008	UU	29	100	67	U	148	670						
MW-514	06/17/14	NA	U	NA	NA	NA		43	76	66	U	152	615						
MW-514	12/11/14	0.2	U	NA	NA	0.008		33	50	69	U	93	556						
MW-514	06/24/15	NA	U	NA	NA	NA		32	50	68	U	91	557						
MW-514 (Duplicate)	06/24/15	NA	U	NA	NA	NA		29	50	69	U	74	UU						
MW-514	10/25/16	0.5	U	0.5	U	0.008	UU	46	50	100	U	98	UU						
MW-514	07/27/17	0.5	U	NA	NA	0.008	UU	47	50	110	U	104	UU						
MW-514	03/21/18	0.2	U	NA	NA	0.008	UU	45	50	100	U	98	UU						
MW-514	06/28/18	0.5	U	NA	NA	0.008	UU	49	50	110	U	105	UU						
MW-514	09/20/18	0.5	U	NA	NA	0.008	UU	45	19	100	HU	82	UU						
MW-514	11/29/18	0.5	U	NA	NA	0.008	UU	45	19	100	U	82	UU						
MW-515	10/22/08	1.86		1.35		1.00		4.47		0.007	UU	248	U	575	JZ	495	U	947	648
MW-515 (Duplicate)	10/22/08	1.92		1.40		1.07		4.70		0.007	UU	248	U	603	JZ	495	U	975	651
MW-515	12/10/08	0.50	U	0.50	U	0.50	U	1.00	U	0.007	UU	243	U	100		485	U	464	544
MW-515	02/24/09	0.5	U	NA	NA	NA	NA	NA	NA	0.008	UU	71		69		68	U	174	587
MW-515	04/22/09	0.5	U	NA	NA	NA	NA	NA	NA	0.007	UU	77		59		69	U	171	575
MW-515	06/24/09	0.5	U	NA	NA	NA	NA	NA	NA	0.007	UU	170		85		76	U	293	561
MW-515	08/20/09	0.5	U	NA	NA	NA	NA	NA	NA	0.012	UU	200		63		75	U	301	543
MW-515 (Duplicate)	08/20/09	0.5	U	NA	NA	NA	NA	NA	NA	0.013	UU	340		110		75	U	488	546
MW-515	10/27/09	0.5	U	NA	NA	NA	NA	NA	NA	0.012	UU	79		50	U	70	U	139	536
MW-515	01/20/10	NA		NA	NA	NA	NA	NA	NA	NA		34		50	U	69	U	94	556
MW-515	04/21/10	NA		NA	NA	NA	NA	NA	NA	NA		32		50	U	67	U	91	558
MW-515	07/21/10	NA		NA	NA	NA	NA	NA	NA	NA		120		50	U	66	U	178	528
MW-515	10/27/10	0.5	U	NA	NA	NA	NA	NA	NA	0.012	UU	52		50	U	67	U	111	546
MW-515	06/16/11	NA		NA	NA	NA	NA	NA	NA	NA		200		50	U	67	U	259	519
MW-515	12/14/11	0.2	U	NA	NA	NA	NA	NA	NA	0.008		28	U	50	U	66	U	72	UU
MW-515	06/29/12	NA		NA	NA	NA	NA	NA	NA	NA		29	U	50	U	67	U	73	UU
MW-515	12/17/12	0.2	U	NA	NA	NA	NA	NA	NA	0.008	UU	29	U	50	U	67	U	73	UU
MW-515	06/27/13	NA		NA	NA	NA	NA	NA	NA	NA		29	U	50	U	67	U	73	UU
MW-515	12/18/13	0.2	U	NA	NA	NA	NA	NA	NA	0.008	UU	30	U	50	U	70	U	75	UU
MW-515	06/19/14	NA		NA	NA	NA	NA	NA	NA	NA		29	U	50	U	67	U	73	UU
MW-515	12/11/14	0.2	U	NA	NA	NA	NA	NA	NA	0.008	UU	29	U	50	U	67	U	73	UU
MW-515	06/25/15	NA		NA	NA	NA	NA	NA	NA	NA		28	U	50	U	66	U	72	UU
MW-515	10/25/16	0.5	U	0.5	U	0.5	U	1.5	U	0.008	UU	47	U	50	U	100	U	99	UU
MW-515	07/25/17	0.5	U	NA	NA	NA	NA	NA	NA	0.008	UU	45	U	50	U	100	U	98	UU
MW-515	03/21/18	0.2	U	NA	NA	NA	NA	NA	NA	0.008	UU	50	U	50	U	110	U	105	UU
MW-515	06/28/18	0.5	U	NA	NA	NA	NA	NA	NA	0.008	UU	47	U	50	U	110	U	104	UU
MW-515	09/19/18	0.5	U	NA	NA	NA	NA	NA	NA	0.008	UU	120		19	U	110	U	185	510
MW-515	11/28/18	0.5	U	NA	NA	NA	NA	NA	NA	0.008	UU	48	U	19	U	110	U	89	UU
MW-515 (Duplicate)	11/28/18	0.5	U	NA	NA	NA	NA	NA	NA	0.008	UU	50	U	19	U	110	U	90	UU
MW-516	10/22/08	0.779		0.711		0.50	U	3.96		0.007	UU	248	U	429	JZ	495	U	801	626
MW-516	12/10/08	0.50	U	0.50	U	0.50	U	1.00	U	0.007	UU	243	U	114		485	U	478	549
MW-516	02/24/09	0.5	U	NA	NA	NA	NA	NA	NA	0.008	UU	30	U	50	U	70	U	75	UU

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 Former Unocal Edmonds Bulk Fuel Terminal  
 11720 Unoco Road  
 Edmonds, Washington

Monitoring Well	Date Sampled	BTEX <sup>1</sup> (µg/L)				Total cPAHs Adjusted for Toxicity <sup>2</sup> (µg/L)		Diesel <sup>3</sup> (µg/L)	Gasoline <sup>4</sup> (µg/L)	Heavy Oil <sup>3</sup> (µg/L)	TPH <sup>5</sup> (µg/L)	TPH CUL <sup>6</sup> (µg/L)					
		B	T	E	X	CUL=0.05											
		CUL=16	--	--	--	CUL=0.05											
MW-516	04/22/09	0.5	U	NA	NA	NA	0.008	UU	31	U	50	U	73	U	77	UU	569
MW-516	06/24/09	0.5	U	NA	NA	NA	0.007	UU	210	U	50	U	69	U	270	UU	518
MW-516	08/20/09	0.5	U	NA	NA	NA	0.013	UU	260	U	50	U	75	U	323	UU	515
MW-516	10/27/09	0.5	U	NA	NA	NA	0.012	UU	140	U	50	U	67	U	199	UU	525
MW-516	01/20/10	NA		NA	NA	NA	NA		29	U	50	U	67	U	73	UU	574
MW-516	04/21/10	NA		NA	NA	NA	NA		30	U	50	U	70	U	75	UU	571
MW-516	07/21/10	NA		NA	NA	NA	NA		150	U	50	U	67	U	209	UU	524
MW-516	10/27/10	0.50	U	NA	NA	NA	0.012	UU	49	U	50	U	67	U	108	UU	548
MW-516 (Duplicate)	10/27/10	0.5	U	NA	NA	NA	0.012	UU	40	U	50	U	66	U	98	UU	553
MW-516	06/16/11	NA		NA	NA	NA	NA		170	U	50	U	67	U	229	UU	521
MW-516	12/14/11	0.2	U	NA	NA	NA	0.007	UU	29	U	50	U	69	U	74	UU	573
MW-516	06/29/12	NA		NA	NA	NA	NA		28	U	50	U	66	U	72	UU	575
MW-516	12/17/12	0.2	U	NA	NA	NA	0.008	UU	29	U	50	U	67	U	73	UU	574
MW-516	06/27/13	NA		NA	NA	NA	NA		30	U	50	U	69	U	75	UU	572
MW-516	12/18/13	0.2	U	NA	NA	NA	0.008	UU	31	U	50	U	72	U	77	UU	570
MW-516	06/19/14	NA		NA	NA	NA	NA		28	U	50	U	66	U	72	UU	575
MW-516 (Duplicate)	06/19/14	NA		NA	NA	NA	NA		29	U	50	U	67	U	73	UU	574
MW-516	12/11/14	0.2	U	NA	NA	NA	0.008	UU	29	U	50	U	67	U	73	UU	574
MW-516	06/25/15	NA		NA	NA	NA	NA		28	U	50	U	66	U	72	UU	575
MW-516	10/25/16	0.5	U	0.5	U	0.5	0.008	UU	47	U	50	U	100	U	99	UU	553
MW-516	07/25/17	0.5	U	NA	NA	NA	0.008	UU	45	U	50	U	100	U	98	UU	553
MW-516 (Duplicate)	07/25/17	0.5	U	NA	NA	NA	0.008	UU	46	U	50	U	100	U	98	UU	553
MW-516	03/21/18	0.2	U	NA	NA	NA	0.008	UU	48	U	50	U	110	U	104	UU	550
MW-516	06/28/18	0.5	U	NA	NA	NA	0.008	UU	48	U	50	U	110	U	104	UU	550
MW-516	09/19/18	0.5	U	NA	NA	NA	0.008	UU	48	U	19	U	110	U	89	UU	521
MW-516	11/29/18	0.5	U	NA	NA	NA	0.008	UU	48	U	19	U	110	U	89	UU	521
MW-517	10/22/08	1.24		0.50	U	0.884	0.008	UU	248	U	275	JZ	495	U	647	UU	595
MW-517	12/10/08	0.50	U	0.50	U	0.50	0.007	UU	240	U	130	U	481	U	491	UU	555
MW-517	02/24/09	0.5	U	NA	NA	NA	0.008	UU	50	U	50	U	72	U	111	UU	546
MW-517	04/22/09	0.5	U	NA	NA	NA	0.008	UU	100	U	50	U	71	U	161	UU	531
MW-517	06/24/09	0.5	U	NA	NA	NA	0.007	UU	460	U	50	U	86	U	571	UU	508
MW-517	08/20/09	0.5	U	NA	NA	NA	0.012	UU	230	U	120	U	69	U	385	UU	566
MW-517	10/27/09	0.5	U	NA	NA	NA	0.012	UU	160	U	54	U	73	U	251	UU	544
MW-517	01/20/10	NA		NA	NA	NA	NA		40	U	50	U	69	U	100	UU	552
MW-517	04/21/10	NA		NA	NA	NA	NA		75	U	50	U	67	U	134	UU	538
MW-517 (Duplicate)	04/21/10	NA		NA	NA	NA	NA		94	U	50	U	70	U	154	UU	532
MW-517	07/20/10	NA		NA	NA	NA	NA		200	U	50	U	66	U	258	UU	519
MW-517	10/27/10	0.5	U	NA	NA	NA	0.012	UU	77	U	50	U	72	U	138	UU	536
MW-517	06/16/11	NA		NA	NA	NA	NA		89	U	50	U	67	U	148	UU	534
MW-517	12/14/11	0.2	U	NA	NA	NA	0.007	UU	28	U	50	U	66	U	72	UU	575
MW-517	06/29/12	NA		NA	NA	NA	NA		28	U	50	U	66	U	72	UU	575
MW-517	12/17/12	0.2	U	NA	NA	NA	0.008	UU	29	U	50	U	67	U	73	UU	574
MW-517	06/27/13	NA		NA	NA	NA	NA		29	U	50	U	67	U	73	UU	574
MW-517	12/18/13	0.2	U	NA	NA	NA	0.008	UU	30	U	50	U	70	U	75	UU	571
MW-517	06/19/14	NA		NA	NA	NA	NA		28	U	50	U	66	U	72	UU	575
MW-517	12/11/14	0.2	U	NA	NA	NA	0.008	UU	29	U	50	U	67	U	73	UU	574
MW-517	06/25/15	NA		NA	NA	NA	NA		29	U	50	U	67	U	73	UU	574
MW-517	10/25/16	0.5	U	0.5	U	0.5	0.008	UU	49	U	50	U	110	U	105	UU	549
MW-517	07/25/17	0.5	U	NA	NA	NA	0.008	UU	46	U	61	U	100	U	134	UU	603
MW-517	03/21/18	0.2	U	NA	NA	NA	0.008	UU	49	U	50	U	110	U	105	UU	549
MW-517	06/28/18	0.5	U	NA	NA	NA	0.008	UU	47	U	50	U	110	U	104	UU	550
MW-517	09/19/18	0.5	U	NA	NA	NA	0.008	UU	47	U	19	U	100	U	83	UU	522
MW-517	11/29/18	0.5	U	NA	NA	NA	0.008	UU	46	U	19	U	100	U	83	UU	523
MW-518*	10/22/08	0.503		0.50	U	0.50	0.008	UU	248	U	770	JZ	495	U	1,142	UU	669
MW-518*	12/10/08	0.50	U	0.50	U	0.50	0.007	UU	245	U	796	JZ	490	U	1,164	UU	673

Table 3-4  
 Summary of Groundwater Analytical Data  
 Petroleum and Polynuclear Aromatic Hydrocarbons  
 Former Unocal Edmonds Bulk Fuel Terminal  
 11720 Unoco Road  
 Edmonds, Washington

Monitoring Well	Date Sampled	BTEX <sup>1</sup> (µg/L)				Total cPAHs Adjusted for Toxicity <sup>2</sup> (µg/L)		Diesel <sup>3</sup> (µg/L)	Gasoline <sup>4</sup> (µg/L)	Heavy Oil <sup>3</sup> (µg/L)	TPH <sup>5</sup> (µg/L)	TPH CUL <sup>6</sup> (µg/L)					
		B	T	E	X	CUL=0.05											
		CUL=16	--	--	--	CUL=0.05											
MW-518*	02/25/09	0.5	U	NA	NA	NA	0.007	UU	450	880	73	1,403	654				
MW-518*	04/22/09	0.5	U	NA	NA	NA	0.007	UU	480	650	72	1,202	627				
MW-518*	06/25/09	0.5	U	NA	NA	NA	0.007	UU	200	440	70	675	662				
MW-518*	08/20/09	0.5	U	NA	NA	NA	0.013	UU	300	730	71	1,066	673				
MW-518*	10/30/09	0.5	U	NA	NA	NA	0.013	UU	310	660	74	1,007	663				
MW-518*	01/20/10	NA		NA	NA	NA	NA		230	660	67	924	683				
MW-518*	04/21/10	NA		NA	NA	NA	NA		240	630	75	908	676				
MW-518*	07/21/10	NA		NA	NA	NA	NA		310	350	73	697	616				
MW-518* (Duplicate)	07/21/10	NA		NA	NA	NA	NA		400	270	78	709	583				
MW-518*	10/28/10	0.5	U	NA	NA	NA	0.012	UU	290	600	67	924	661				
MW-518*	03/23/11	NA		NA	NA	NA	NA		390	330	68	754	598				
MW-518*	06/16/11	NA		NA	NA	NA	NA		200	140	67	374	582				
MW-518*	09/27/11	NA		NA	NA	NA	NA		66	230	68	330	677				
MW-518*	12/14/11	0.2	U	NA	NA	NA	0.007	UU	40	440	67	514	737				
MW-518*	03/28/12	NA		NA	NA	NA	NA		28	50	66	72	UU	575			
MW-518*	06/29/12	NA		NA	NA	NA	NA		29	93	69	142	663				
MW-518*	09/27/12	NA		NA	NA	NA	NA		59	240	68	333	685				
MW-518*	12/17/12	0.2	U	NA	NA	NA	0.008	UU	29	180	69	229	709				
MW-518*	03/27/13	NA		NA	NA	NA	NA		48	510	66	591	739				
MW-518*	06/27/13	NA		NA	NA	NA	NA		29	50	67	73	UU	574			
MW-518*	09/25/13	NA		NA	NA	NA	NA		79	50	69	99	UU	552			
MW-518*	12/19/13	0.2	U	NA	NA	NA	0.008	UU	78	860	71	974	748				
MW-518*	03/28/14	NA		NA	NA	NA	NA		29	110	68	159	676				
MW-518*	06/18/14	NA		NA	NA	NA	NA		28	63	66	110	637				
MW-518* (Duplicate)	06/18/14	NA		NA	NA	NA	NA		28	62	66	109	636				
MW-518*	10/01/14	NA		NA	NA	NA	NA		68	260	72	364	683				
MW-518*	12/11/14	0.2	U	NA	NA	NA	0.008		43	290	66	366	711				
MW-518*	03/25/15	NA		NA	NA	NA	NA		39	390	67	463	731				
MW-518*	06/25/15	NA		NA	NA	NA	NA		59	600	66	692	741				
MW-518*	10/25/16	0.5	U	0.5	U	0.5	U	1.5	U	0.008	UU	46	990	100	U	1,063	768
MW-518*	07/25/17	0.5	U	NA	NA	NA	0.008	UU	46	190	100	263	686				
MW-518*	03/21/18	0.2	U	NA	NA	NA	0.008	UU	48	220	110	299	691				
MW-518*	06/28/18	0.5	U	NA	NA	NA	0.008	UU	47	690	100	764	756				
MW-518* (Duplicate)	06/28/18	0.5	U	NA	NA	NA	0.008	UU	47	630	100	704	753				
MW-518*	09/19/18	0.5	U	NA	NA	NA	0.008	UU	47	370	100	444	728				
MW-518*	11/28/18	0.5	U	NA	NA	NA	0.008	UU	47	840	110	919	761				
MW-518*	02/07/19	0.03	U	NA	NA	NA	0.008		46	340	100	413	723				
MW-519	10/22/08	0.5	U	0.5	U	0.5	U	1.00	U	0.008	UU	248	80	495	U	451	536
MW-519 (Duplicate)	10/22/08	5	U	5	U	5	U	1.00	U	0.007	UU	248	84	495	U	455	537
MW-519	12/09/08	0.50	U	0.50	U	0.50	U	1.00	U	0.007	UU	250	64.1	500	U	439	529
MW-519	02/24/09	0.5	U	NA	NA	NA	0.008	UU	83	50	71	144	535				
MW-519	04/21/09	0.5	U	NA	NA	NA	0.008	UU	150	50	74	212	523				
MW-519	06/24/09	0.5	U	NA	NA	NA	0.007	UU	220	50	70	280	517				
MW-519	08/18/09	0.5	U	NA	NA	NA	0.013	UU	290	50	75	353	514				
MW-519 (Duplicate)	08/18/09	0.5	U	NA	NA	NA	0.119	UU	250	50	72	311	516				
MW-519	10/27/09	0.5	U	NA	NA	NA	0.013	UU	58	50	66	116	544				
MW-519	01/19/10	NA		NA	NA	NA	NA		170	50	67	229	521				
MW-519	04/21/10	NA		NA	NA	NA	NA		82	50	71	143	535				
MW-519	07/20/10	NA		NA	NA	NA	NA		290	50	67	349	514				
MW-519	10/26/10	0.50	U	NA	NA	NA	0.012	UU	43	50	73	105	549				
MW-519 (Duplicate)	10/26/10	0.50	U	NA	NA	NA	0.012	UU	54	50	79	119	543				
MW-519	06/15/11	NA		NA	NA	NA	NA		260	50	68	319	515				
MW-519	12/14/11	0.2	U	NA	NA	NA	0.008	UU	29	50	67	73	UU	574			
MW-519	06/28/12	NA		NA	NA	NA	NA		30	50	71	76	UU	571			
MW-519	12/17/12	0.2	U	NA	NA	NA	0.008	UU	28	50	66	72	UU	575			
MW-519	06/25/13	NA		NA	NA	NA	NA		29	50	68	74	UU	573			

Table 3-4  
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 Petroleum and Polynuclear Aromatic Hydrocarbons  
 Former Unocal Edmonds Bulk Fuel Terminal  
 11720 Unoco Road  
 Edmonds, Washington

Monitoring Well	Date Sampled	BTEX <sup>1</sup> (µg/L)				Total cPAHs Adjusted for Toxicity <sup>2</sup> (µg/L)		Diesel <sup>3</sup> (µg/L)	Gasoline <sup>4</sup> (µg/L)	Heavy Oil <sup>3</sup> (µg/L)	TPH <sup>5</sup> (µg/L)	TPH CUL <sup>6</sup> (µg/L)								
		B	T	E	X	CUL=0.05														
		CUL=16	--	--	--															
MW-519	12/17/13	0.2	U	NA	NA	NA	NA	0.008	UU	28	U	50	U	66	U	72	UU	575		
MW-519	06/18/14	NA		NA	NA	NA	NA	NA		29	U	50	U	67	U	73	UU	574		
MW-519	12/10/14	0.2	U	NA	NA	NA	NA	0.008	UU	28	U	50	U	65	U	72	UU	575		
MW-519	06/24/15	NA		NA	NA	NA	NA	NA		29	U	50	U	67	U	73	UU	574		
MW-519	10/24/16	0.5	U	0.5	U	0.5	U	1.5	U	47	U	50	U	110	U	104	UU	550		
MW-519	07/25/17	0.5	U	NA		NA		NA		45	U	50	U	100	U	98	UU	553		
MW-519	03/22/18	0.5	U	NA		NA		NA		45	U	50	U	100	U	98	UU	553		
MW-519 (Duplicate)	03/22/18	0.5	U	NA		NA		NA		45	U	50	U	100	U	98	UU	553		
MW-519	06/27/18	0.5	U	NA		NA		NA		46	U	50	U	100	U	98	UU	553		
MW-519	09/18/18	0.5	U	NA		NA		NA		47	U	19	U	100	U	83	UU	522		
MW-519	11/29/18	0.5	U	NA		NA		NA		46	U	19	U	100	U	83	UU	523		
MW-520	10/21/08	1.45		0.50	U	0.50	U	1.00	U	0.008	UU	250	U	356		500	U	731	612	
MW-520	12/09/08	3.77		0.50	U	0.50	U	1.00	U	0.008	UU	243	U	125		485	U	489	553	
MW-520	02/23/09	1.6		NA		NA		NA		0.008	UU	160		110		76	U	308	577	
MW-520	04/22/09	7.6		NA		NA		NA		0.007	UU	110		50	U	66	U	168	530	
MW-520 (Duplicate)	04/22/09	7.3		NA		NA		NA		0.007	UU	110		50	U	67	U	169	529	
MW-520	06/24/09	0.5		NA		NA		NA		0.007	UU	180		50	U	69	U	240	520	
MW-520	08/18/09	0.5	U	NA		NA		NA		0.012	UU	140		50	U	72	U	201	524	
MW-520	10/27/09	0.5	U	NA		NA		NA		0.012	UU	130		50	U	73	U	192	526	
MW-520	01/19/10	NA		NA		NA		NA		NA		30	U	50	U	70	U	75	UU	571
MW-520	04/20/10	NA		NA		NA		NA		NA		52		50	U	68	U	111	546	
MW-520	07/20/10	NA		NA		NA		NA		NA		320		50	U	67	U	379	513	
MW-520	10/27/10	0.5	U	NA		NA		NA		0.012	UU	110		50	U	66	U	168	530	
MW-520	06/15/11	NA		NA		NA		NA		NA		120		50	U	67	U	179	528	
MW-520	12/14/11	0.2	U	NA		NA		NA		0.007	UU	29	U	50	U	67	U	73	UU	574
MW-520	06/28/12	NA		NA		NA		NA		NA		29	U	50	U	67	U	73	UU	574
MW-520	12/14/12	0.2	U	NA		NA		NA		0.008	UU	28		50	U	110		163	531	
MW-520	06/25/13	NA		NA		NA		NA		NA		29	U	62		67	U	110	634	
MW-520 (Duplicate)	06/25/13	NA		NA		NA		NA		NA		30	U	50	U	70	U	75	UU	571
MW-520	12/17/13	0.2	U	NA		NA		NA		0.008	UU	30	U	50	U	70	U	75	UU	571
MW-520	06/18/14	NA		NA		NA		NA		NA		29	U	50	U	67	U	73	UU	574
MW-520	12/10/14	0.2	U	NA		NA		NA		0.008	UU	28	U	50	U	66	U	72	UU	575
MW-520	06/24/15	NA		NA		NA		NA		NA		28	U	50	U	65	U	72	UU	575
MW-520	10/24/16	0.5	U	0.5	U	0.5	U	1.5	U	0.008	UU	47	U	50	U	100	U	99	UU	553
MW-520	07/25/17	0.5	U	NA		NA		NA		0.008	UU	46	U	50	U	100	U	98	UU	553
MW-520	03/20/18	0.2	U	NA		NA		NA		0.008	UU	47	U	50	U	110	U	104	UU	550
MW-520	06/28/18	0.5	U	NA		NA		NA		0.008	UU	48	U	50	U	110	U	104	UU	550
MW-520	09/18/18	0.5	U	NA		NA		NA		0.008	UU	46	U	19	U	100	U	83	UU	523
MW-520	11/29/18	0.5	U	NA		NA		NA		0.008	UU	45	U	19	U	100	U	82	UU	523
MW-521	10/21/08	0.50	U	0.50	U	0.50	U	1.00	U	0.007	UU	245	U	57.9		490	U	425		527
MW-521	12/09/08	0.50	U	0.50	U	0.50	U	1.00	U	0.008	UU	250	U	98.4		500	U	473		542
MW-521	02/23/09	1.7		NA		NA		NA		0.008	UU	90		50	U	78	U	154		532
MW-521	04/21/09	0.5	U	NA		NA		NA		0.008	UU	31	U	50	U	73	U	77	UU	569
MW-521	06/23/09	0.5	U	NA		NA		NA		0.008	UU	47		50	U	71	U	108		548
MW-521	08/19/09	0.5	U	NA		NA		NA		0.012	UU	45		50	U	71	U	106		549
MW-521	10/26/09	0.5	U	NA		NA		NA		0.012	UU	120		50	U	69	U	180		528
MW-521 (Duplicate)	10/26/09	0.5	U	NA		NA		NA		0.012	UU	78		50	U	74	U	140		536
MW-521	01/19/10	NA		NA		NA		NA		NA		30	U	50	U	70	U	75	UU	571
MW-521	04/20/10	NA		NA		NA		NA		NA		31	U	50	U	73	U	77	UU	569
MW-521	07/20/10	NA		NA		NA		NA		NA		70		50	U	67	U	129		539
MW-521	10/27/10	0.5	U	NA		NA		NA		0.013	UU	77		50	U	72	U	138		536
MW-521	06/15/11	NA		NA		NA		NA		NA		47		50	U	67	U	106		549
MW-521	12/14/11	0.2	U	NA		NA		NA		0.007	UU	29	U	50	U	67	U	73	UU	574
MW-521	06/28/12	NA		NA		NA		NA		NA		28	U	50	U	66	U	72	UU	575
MW-521	12/17/12	0.2	U	NA		NA		NA		0.008	UU	28	U	50	U	66	U	72	UU	575

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 Petroleum and Polynuclear Aromatic Hydrocarbons  
 Former Unocal Edmonds Bulk Fuel Terminal  
 11720 Unoco Road  
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Monitoring Well	Date Sampled	BTEX <sup>1</sup> (µg/L)				Total cPAHs Adjusted for Toxicity <sup>2</sup> (µg/L)		Diesel <sup>3</sup> (µg/L)	Gasoline <sup>4</sup> (µg/L)	Heavy Oil <sup>3</sup> (µg/L)	TPH <sup>5</sup> (µg/L)	TPH CUL <sup>6</sup> (µg/L)						
		B	T	E	X	CUL=0.05												
		CUL=16	--	--	--	--	--											
MW-521	06/25/13	NA	NA	NA	NA	NA	UU	29	U	50	U	69	U	74	UU	573		
MW-521	12/17/13	0.2	U	NA	NA	NA	UU	29	U	50	U	67	U	73	UU	574		
MW-521	06/18/14	NA		NA	NA	NA		28	U	50	U	66	U	72	UU	575		
MW-521	12/10/14	0.3		NA	NA	NA	UU	28	U	50	U	66	U	72	UU	575		
MW-521	06/24/15	NA		NA	NA	NA		29	U	50	U	68	U	74	UU	573		
MW-521	10/24/16	0.5	U	0.5	U	0.5	U	1.5	U	50	U	110	U	104	UU	550		
MW-521	07/25/17	0.5	U	NA		NA		45	U	50	U	100	U	98	UU	553		
MW-521	03/20/18	0.2	U	NA		NA		46	U	50	U	100	U	98	UU	553		
MW-521	06/28/18	0.5	U	NA		NA		48	U	50	U	110	U	104	UU	550		
MW-521	09/18/18	0.5	U	NA		NA		46	U	19	U	100	U	83	UU	523		
MW-521	11/30/18	0.5	U	NA		NA		46	U	19	U	100	U	83	UU	523		
MW-522*	10/21/08	1.46		0.50	U	0.50	U	1.41		250	U	534	JZ	500	U	909	641	
MW-522*	12/09/08	0.782		0.5	U	0.5	U	1.00	UU	245	U	183		490	U	551	571	
MW-522* (Duplicate)	12/09/08	0.805		5	U	5	U	1.00	UU	245	U	186		490	U	554	572	
MW-522*	02/23/09	0.5	U	NA		NA		0.007	UU	490		160		71	U	686	548	
MW-522*	04/21/09	0.5	U	NA		NA		0.008	UU	620		62		97		779	515	
MW-522*	06/23/09	0.5	U	NA		NA		0.007	UU	330		100		67	U	464	544	
MW-522*	08/18/09	0.5		NA		NA		0.012	UU	300		94		67	U	428	545	
MW-522*	10/26/09	0.5		NA		NA		0.012	UU	650		50	U	280		955	505	
MW-522*	01/19/10	NA		NA		NA		NA		39		50	U	66	U	97	553	
MW-522*	04/20/10	NA		NA		NA		NA		220		50	U	81	U	286	517	
MW-522*	07/20/10	NA		NA		NA		NA		470		50	U	76	U	533	509	
MW-522*	10/26/10	0.5	U	NA		NA		0.012	UU	260		50	U	66	U	318	515	
MW-522*	03/22/11	NA		NA		NA		NA		150		50	U	66	U	208	524	
MW-522*	06/15/11	NA		NA		NA		NA		380		50	U	72	U	441	511	
MW-522*	09/27/11	NA		NA		NA		NA		29		50	U	67	U	88	560	
MW-522* (Duplicate)	09/27/11	NA		NA		NA		NA		42		50	U	66	U	100	552	
MW-522*	12/14/11	0.2	U	NA		NA		0.007	UU	29	U	50	U	67	U	73	UU	574
MW-522*	03/28/12	NA		NA		NA		NA		29	U	50	U	67	U	73	UU	574
MW-522*	06/28/12	NA		NA		NA		NA		28	U	50	U	66	U	72	UU	575
MW-522*	09/26/12	NA		NA		NA		NA		29	U	50	U	68	U	74	UU	573
MW-522*	12/14/12	0.2	U	NA		NA		0.008	UU	41		50	U	140		206	524	
MW-522*	03/26/13	NA		NA		NA		NA		29	U	50	U	67	U	73	UU	574
MW-522* (Duplicate)	03/26/13	NA		NA		NA		NA		29	U	50	U	67	U	73	UU	574
MW-522*	06/25/13	NA		NA		NA		NA		29	U	50	U	67	U	73	UU	574
MW-522*	09/25/13	NA		NA		NA		NA		36	U	50	U	70	U	78	UU	568
MW-522*	12/17/13	0.2	U	NA		NA		0.008	UU	31	U	50	U	72	U	77	UU	570
MW-522*	03/26/14	NA		NA		NA		NA		29	U	50	U	67	U	73	UU	574
MW-522*	06/18/14	NA		NA		NA		NA		29	U	50	U	67	U	73	UU	574
MW-522*	10/01/14	NA		NA		NA		NA		30	U	50	U	71	U	76	UU	571
MW-522* (Duplicate)	10/01/14	NA		NA		NA		NA		30	U	50	U	70	U	75	UU	571
MW-522*	12/10/14	0.3		NA		NA		0.008	UU	28	U	50	U	66	U	72	UU	575
MW-522*	03/26/15	NA		NA		NA		NA		30	U	50	U	69	U	75	UU	572
MW-522* (Duplicate)	03/26/15	NA		NA		NA		NA		29	U	50	U	69	U	74	UU	573
MW-522*	06/24/15	NA		NA		NA		NA		28	U	50	U	66	U	72	UU	575
MW-522*	10/24/16	0.5	U	0.5	U	0.5	U	1.5	U	47	U	50	U	100	U	99	UU	553
MW-522*	07/25/17	0.5	U	NA		NA		0.008	UU	80		50	U	700		805	506	
MW-522*	03/20/18	0.2	U	NA		NA		0.008	UU	46	U	50	U	100	U	98	UU	553
MW-522*	06/28/18	0.5	U	NA		NA		0.008	UU	50	U	50	U	110	U	105	UU	549
MW-522*	09/18/18	0.5	U	NA		NA		0.008	UU	48	U	19	U	110	U	89	UU	521
MW-522*	11/29/18	0.5	U	NA		NA		0.008	UU	50	U	19	U	110	U	90	UU	521
MW-523*	10/21/08	0.50	U	0.50	U	0.50	U	1.00	U	245	U	63		490	U	431		529
MW-523*	12/09/08	0.50	U	0.50	U	0.50	U	1.00	U	248	U	50	U	495	U	397	UU	512
MW-523*	02/23/09	0.5	U	NA		NA		0.007	UU	32		50	U	68	U	91		557
MW-523*	04/21/09	0.5	U	NA		NA		0.007	UU	30	U	50	U	69	U	75	UU	572

Table 3-4  
 Summary of Groundwater Analytical Data  
 Petroleum and Polynuclear Aromatic Hydrocarbons  
 Former Unocal Edmonds Bulk Fuel Terminal  
 11720 Unoco Road  
 Edmonds, Washington

Monitoring Well	Date Sampled	BTEX <sup>1</sup> (µg/L)				Total cPAHs Adjusted for Toxicity <sup>2</sup> (µg/L)		Diesel <sup>3</sup> (µg/L)	Gasoline <sup>4</sup> (µg/L)	Heavy Oil <sup>3</sup> (µg/L)	TPH <sup>5</sup> (µg/L)	TPH CUL <sup>6</sup> (µg/L)								
		B	T	E	X															
		CUL=16	--	--	--	CUL=0.05	--													
MW-523*	06/23/09	0.5	U	NA	NA	NA	0.007	UU	39	50	U	68	U	98	553					
MW-523* (Duplicate)	06/23/09	0.5	U	NA	NA	NA	0.008	UU	78	50	U	68	U	137	537					
MW-523*	08/18/09	0.5	U	NA	NA	NA	0.012	UU	140	50	U	66	U	198	525					
MW-523*	10/26/09	0.5	U	NA	NA	NA	0.012	UU	120	50	U	66	U	178	528					
MW-523*	01/19/10	NA		NA	NA	NA	NA		32	50	U	69	U	92	557					
MW-523*	04/20/10	NA		NA	NA	NA	NA		35	U	50	U	83	U	84	UU	563			
MW-523*	07/20/10	NA		NA	NA	NA	NA		61		50	U	80	U	126	540				
MW-523*	10/26/10	0.5	U	NA	NA	NA	0.013	UU	160		50	U	74	U	222	522				
MW-523*	03/22/11	NA		NA	NA	NA	NA		28	U	50	U	66	U	72	UU	575			
MW-523*	06/15/11	NA		NA	NA	NA	NA		73		50	U	67	U	132	538				
MW-523*	09/27/11	NA		NA	NA	NA	NA		29	U	50	U	67	U	73	UU	574			
MW-523*	12/13/11	0.2	U	NA	NA	NA	0.007	UU	28	U	50	U	66	U	72	UU	575			
MW-523*	03/28/12	NA		NA	NA	NA	NA		29	U	50	U	67	U	73	UU	574			
MW-523*	06/28/12	NA		NA	NA	NA	NA		28	U	50	U	66	U	72	UU	575			
MW-523*	09/26/12	NA		NA	NA	NA	NA		29	U	50	U	67	U	73	UU	574			
MW-523* (Duplicate)	09/26/12	NA		NA	NA	NA	NA		31	U	50	U	71	U	76	UU	570			
MW-523*	12/14/12	0.2	U	NA	NA	NA	0.008	UU	30	U	50	U	71	U	76	UU	571			
MW-523*	03/26/13	NA		NA	NA	NA	NA		29	U	50	U	69	U	74	UU	573			
MW-523*	06/25/13	NA		NA	NA	NA	NA		29	U	50	U	68	U	74	UU	573			
MW-523*	09/25/13	NA		NA	NA	NA	NA		29	U	50	U	67	U	73	UU	574			
MW-523*	12/17/13	0.2	U	NA	NA	NA	0.008	UU	30	U	50	U	160		200	525				
MW-523*	03/27/14	NA		NA	NA	NA	NA		29	U	50	U	67	U	73	UU	574			
MW-523* (Duplicate)	03/27/14	NA		NA	NA	NA	NA		30	U	50	U	70	U	75	UU	571			
MW-523*	06/18/14	NA		NA	NA	NA	NA		29	U	50	U	68	U	74	UU	573			
MW-523*	09/30/14	NA		NA	NA	NA	NA		30	U	50	U	69	U	75	UU	572			
MW-523*	12/10/14	0.3		NA	NA	NA	0.008	UU	30	U	50	U	69	U	75	UU	572			
MW-523*	03/25/15	NA		NA	NA	NA	NA		29	U	50	U	68	U	74	UU	573			
MW-523*	06/23/15	NA		NA	NA	NA	NA		28	U	50	U	66	U	72	UU	575			
MW-524*	10/21/08	0.50	U	0.50	U	0.50	U	1.00	U	240	U	50	U	481	U	386	UU	512		
MW-524*	12/09/08	0.50	U	0.50	U	0.50	U	1.00	U	243	U	50	U	485	U	389	UU	512		
MW-524*	02/23/09	0.5	U	NA		NA		NA		32	U	50	U	74	U	78	UU	568		
MW-524*	04/21/09	0.5	U	NA		NA		NA		29	U	50	U	67	U	73	UU	574		
MW-524*	06/23/09	0.5	U	NA		NA		NA		29	U	50	U	67	U	73	UU	574		
MW-524*	08/18/09	0.5	U	NA		NA		NA		29	U	50	U	67	U	73	UU	574		
MW-524*	10/26/09	0.5	U	NA		NA		NA		0.012	UU	270		50	U	150		445	511	
MW-524*	01/19/10	NA		NA		NA		NA		30	U	50	U	71	U	76	UU	571		
MW-524*	04/20/10	NA		NA		NA		NA		28	U	50	U	66	U	72	UU	575		
MW-524*	07/20/10	NA		NA		NA		NA		32	U	50	U	75	U	79	UU	568		
MW-524*	10/26/10	0.5	U	NA		NA		NA		0.012	UU	28	U	50	U	66	U	72	UU	575
MW-524*	03/22/11	NA		NA		NA		NA		28	U	50	U	66	U	72	UU	575		
MW-524*	06/17/11	NA		NA		NA		NA		36		50	U	67	U	95		555		
MW-524*	09/27/11	NA		NA		NA		NA		29	U	50	U	67.0	U	73	UU	574		
MW-524*	12/13/11	0.2	U	NA		NA		NA		0.007	UU	29	U	50	U	68	U	74	UU	573
MW-524*	03/28/12	NA		NA		NA		NA		29	U	50	U	67	U	73	UU	574		
MW-524*	06/28/12	NA		NA		NA		NA		30	U	50	U	70	U	75	UU	571		
MW-524*	09/26/12	NA		NA		NA		NA		29	U	50	U	67	U	73	UU	574		
MW-524*	12/14/12	0.2	U	NA		NA		NA		0.008	UU	28	U	50	U	66	U	72	UU	575
MW-524* (Duplicate)	12/14/12	0.2	U	NA		NA		NA		0.008	UU	29	U	50	U	67	U	73	UU	574
MW-524*	03/26/13	NA		NA		NA		NA		32	U	50	U	74	U	78	UU	568		
MW-524*	06/25/13	NA		NA		NA		NA		29	U	50	U	68	U	74	UU	573		
MW-524*	09/24/13	NA		NA		NA		NA		28	U	50	U	66	U	72	UU	575		
MW-524*	06/25/13	NA		NA		NA		NA		29	U	50	U	68	U	74	UU	573		
MW-524*	12/17/13	0.2	U	NA		NA		NA		0.008	UU	28	U	50	U	66	U	72	UU	575
MW-524*	03/28/14	NA		NA		NA		NA		29	U	50	U	67	U	73	UU	574		
MW-524*	06/18/14	NA		NA		NA		NA		29	U	50	U	67	U	73	UU	574		



Table 3-4  
 Summary of Groundwater Analytical Data  
 Petroleum and Polynuclear Aromatic Hydrocarbons  
 Former Unocal Edmonds Bulk Fuel Terminal  
 11720 Unoco Road  
 Edmonds, Washington

Monitoring Well	Date Sampled	BTEX <sup>1</sup> (µg/L)				Total cPAHs Adjusted for Toxicity <sup>2</sup> (µg/L)	Diesel <sup>3</sup> (µg/L)	Gasoline <sup>4</sup> (µg/L)	Heavy Oil <sup>3</sup> (µg/L)	TPH <sup>5</sup> (µg/L)	TPH CUL <sup>6</sup> (µg/L)
		B	T	E	X						
		CUL=16	--	--	--						
MW-524*	09/30/14	NA	NA	NA	NA	30	50	69	75	572	
MW-524*	12/09/14	0.2 U	NA	NA	0.008 UU	31	50	71	76	570	
MW-524*	03/25/15	NA	NA	NA	NA	29	50	68	74	573	
MW-524*	06/23/15	NA	NA	NA	NA	28	50	66	72	575	
MW-525	06/29/12	NA	NA	NA	NA	330	13,000	66	13,363	787	
MW-525 (Duplicate)	06/29/12	NA	NA	NA	NA	360	11,000	68	11,394	784	
MW-525	12/14/12	5,900	NA	NA	0.012	380	23,000	72	23,416	792	
MW-525	06/26/13	980	NA	NA	NA	150	5,800	68	5,984	786	
MW-525 (Duplicate)	06/26/13	NA	NA	NA	NA	130	5,400	68	5,564	786	
MW-525	12/17/13	990	NA	NA	0.008 UU	140	4,000	69	4,175	780	
MW-525	06/17/14	NA	NA	NA	NA	180	7,800	67	8,014	787	
MW-525	12/09/14	6,200	NA	NA	0.008 UU	720	28,000	66	28,753	788	
MW-525	06/23/15	NA	NA	NA	NA	230	2,700	66	2,963	760	
MW-525	10/26/16	350	2.0	140	0.008 UU	150	3,900	100	4,100	777	
MW-525 (Duplicate)	10/26/16	360	1.9	140	0.008 UU	140	3,300	100	3,490	775	
MW-525	07/26/17	1,200	NA	NA	0.008 UU	130	4,700	110	4,885	782	
MW-525	03/20/18	14	NA	NA	0.008 UU	49	920	110	1,000	764	
MW-525	06/27/18	6.0	NA	NA	0.008 UU	46	1,000	100	1,073	769	
MW-525	09/17/18	6.6	NA	NA	0.008 UU	47	570	100	644	749	
MW-525	11/27/18	0.5 U	NA	NA	0.009	130	19	100	190	510	
MW-526	06/29/12	NA	NA	NA	NA	82	450	67	566	713	
MW-526	12/14/12	2.0	NA	NA	0.008 UU	32	980	66	1,045	771	
MW-526	06/26/13	2.0	NA	NA	NA	82	1,100	67	1,216	757	
MW-526	12/18/13	1.6	NA	NA	0.090	93	850	68	977	742	
MW-526	06/17/14	NA	NA	NA	NA	150	780	67	964	718	
MW-526	12/10/14	1.5	NA	NA	0.008 UU	64	350	66	447	708	
MW-526	06/23/15	NA	NA	NA	NA	140	750	66	923	719	
MW-526 (Duplicate)	06/23/15	NA	NA	NA	NA	100	790	66	923	736	
MW-526	10/24/16	0.5 U	0.5 U	0.5 U	0.008 UU	47	1,000	100	1,074	768	
MW-526 (Duplicate)	10/24/16	0.5 U	0.5 U	0.5 U	0.008 UU	45	960	100	1,033	768	
MW-526	07/26/17	1.5	NA	NA	0.008 UU	120	1,600	100	1,770	756	
MW-526	03/20/18	1.0	NA	NA	0.008 UU	210	1,800	100	2,060	744	
MW-526	06/27/18	0.5 U	NA	NA	0.008 UU	53	1,000	100	1,103	758	
MW-526	09/17/18	0.5 U	NA	NA	0.008 UU	48	710	110	789	755	
MW-526	11/27/18	0.5 U	NA	NA	0.045	8800	84	1400	10,284	502	
MW-526	02/07/19	0.06 J	NA	NA	0.008	100	360	100	510	680	
MW-527	07/02/12	NA	NA	NA	NA	30	50	71	76	571	
MW-527	12/19/12	0.2 U	NA	NA	0.008 UU	28	50	66	72	575	
MW-527	06/28/13	NA	NA	NA	NA	29	50	67	73	574	
MW-527 (Duplicate)	06/28/13	NA	NA	NA	NA	29	50	67	73	574	
MW-527	12/20/13	0.2 U	NA	NA	0.008 UU	29	50	67	73	574	
MW-527	06/19/14	NA	NA	NA	NA	29	50	67	73	574	
MW-527	12/12/14	0.2 U	NA	NA	0.008 UU	29	50	67	73	574	
MW-527 (Duplicate)	12/12/14	0.2 U	NA	NA	0.008 UU	28	50	66	72	575	
MW-527	06/28/15	NA	NA	NA	NA	28	50	65	72	575	
MW-528	07/02/12	NA	NA	NA	NA	29	50	67	73	574	
MW-528	12/19/12	0.2 U	NA	NA	0.008 UU	29	50	68	74	573	
MW-528 (Duplicate)	12/19/12	0.2 U	NA	NA	0.008 UU	29	50	68	74	573	
MW-528	06/28/13	NA	NA	NA	NA	29	50	69	74	573	
MW-528	12/20/13	0.2 U	NA	NA	0.008 UU	29	50	68	74	573	
MW-528	06/19/14	NA	NA	NA	NA	29	50	67	73	574	
MW-528	12/12/14	0.2 U	NA	NA	0.008 UU	29	50	67	73	574	
MW-528 (Duplicate)	12/12/14	0.2 U	NA	NA	0.008 UU	28	50	66	72	575	
MW-528	06/26/15	NA	NA	NA	NA	28	50	66	72	575	
MW-529*	07/02/12	NA	NA	NA	NA	29	50	67	73	574	
MW-529*	09/27/12	NA	NA	NA	NA	32	50	74	78	568	

Table 3-4  
Summary of Groundwater Analytical Data  
Petroleum and Polynuclear Aromatic  
Hydrocarbons Former Unocal Edmonds Bulk Fuel  
Terminal 11720 Unoco Road  
Edmonds, Washington

Monitoring Well	Date Sampled	BTEX <sup>1</sup> (µg/L)				Total cPAHs Adjusted for Toxicity <sup>2</sup> (µg/L)		Diesel <sup>3</sup> (µg/L)	Gasoline <sup>4</sup> (µg/L)	Heavy Oil <sup>3</sup> (µg/L)	TPH <sup>5</sup> (µg/L)	TPH CUL <sup>6</sup> (µg/L)					
		B	T	E	X												
		CUL=16	--	--	--	CUL=0.05	--										
MW-529*	12/17/12	0.2	U	NA	NA	NA	NA	29	U	50	U	68	U	74	UU	573	
MW-529*	03/26/13	NA		NA	NA	NA	NA	31	U	50	U	71	U	76	UU	570	
MW-529*	06/26/13	NA		NA	NA	NA	NA	30	U	50	U	69	U	75	UU	572	
MW-529*	09/24/13	NA		NA	NA	NA	NA	31	U	50	U	73	U	77	UU	569	
MW-529*	12/18/13	0.2	U	NA	NA	NA	NA	29	U	50	U	69	U	74	UU	573	
MW-529*	03/27/14	NA		NA	NA	NA	NA	29	U	50	U	67	U	73	UU	574	
MW-529*	06/17/14	NA		NA	NA	NA	NA	28	U	50	U	66	U	72	UU	575	
MW-529*	09/30/14	NA		NA	NA	NA	NA	29	U	50	U	68	U	74	UU	573	
MW-529*	12/09/14	0.2	U	NA	NA	NA	NA	28	U	50	U	66	U	72	UU	575	
MW-529*	03/25/15	NA		NA	NA	NA	NA	30	U	50	U	69	U	75	UU	572	
MW-529*	06/23/15	NA		NA	NA	NA	NA	28	U	50	U	65	U	72	UU	575	
MW-529*	10/26/16	0.5	U	0.5	U	0.5	U	1.5	U	46	U	100	U	98	UU	553	
MW-529* <sup>DB2</sup>	07/27/17	0.5	U	NA		NA		NA		47	U	50	U	100	U	99	UU
MW-530*	07/02/12	NA		NA	NA	NA	NA	30	U	50	U	70	U	75	UU	571	
MW-530*	09/27/12	NA		NA	NA	NA	NA	29	U	50	U	100		140		536	
MW-530*	12/17/12	0.2	U	NA	NA	NA	NA	90	UU	50	U	260		375		513	
MW-530*	03/27/13	NA		NA	NA	NA	NA	32	U	50	U	74	U	78	UU	568	
MW-530*	06/26/13	NA		NA	NA	NA	NA	30	U	50	U	71	U	76	UU	571	
MW-530*	09/24/13	NA		NA	NA	NA	NA	31	U	50	U	72	U	77	UU	570	
MW-530*	12/18/13	0.2	U	NA	NA	NA	NA	31	U	50	U	71	U	76	UU	570	
MW-530*	03/27/14	NA		NA	NA	NA	NA	28	U	50	U	64	U	71	UU	576	
MW-530*	06/17/14	NA		NA	NA	NA	NA	29	U	50	U	68	U	74	UU	573	
MW-530*	09/30/14	NA		NA	NA	NA	NA	31	U	50	U	73	U	77	UU	569	
MW-530*	12/09/14	0.4		NA	NA	NA	NA	29	U	50	U	68	U	74	UU	573	
MW-530*	03/24/15	NA		NA	NA	NA	NA	29	U	50	U	68	U	74	UU	573	
MW-530*	06/23/15	NA		NA	NA	NA	NA	29	U	50	U	67	U	73	UU	574	
MW-530*	10/26/16	0.5	U	0.5	U	0.5	U	1.5	U	48	U	110	U	104	UU	550	
MW-530*	07/26/17	0.5	U	NA		NA		NA		47	U	50	U	100	U	99	UU
MW-530*	03/20/18	0.2	U	NA		NA		NA		45	U	50	U	100	U	98	UU
MW-530*	06/27/18	0.5	U	NA		NA		NA		46	U	50	U	100	U	98	UU
MW-530*	09/20/18	0.5	U	NA		NA		NA		50	HU	19	U	110	HU	90	UU
MW-530*	11/27/18	0.5	U	NA		NA		NA		45	U	19	U	100	U	82	UU
MW-531	06/28/12	NA		NA	NA	NA	NA	62		73		67	U	169		597	
MW-531	12/18/12	0.2	U	NA		NA		29	U	50	U	67	U	73	UU	574	
MW-531	06/26/13	NA		NA	NA	NA	NA	29		83		68	U	146		635	
MW-531	12/17/13	0.4		NA		NA		30	U	77		69	U	127		648	
MW-531	06/17/14	NA		NA	NA	NA	NA	29	U	50	U	67	U	73	UU	574	
MW-531	12/09/14	0.2	U	NA		NA		30	U	50	U	70	U	75	UU	571	
MW-531	06/23/15	NA		NA	NA	NA	NA	29	U	50	U	69	U	74	UU	573	
MW-531	10/24/16	0.5	U	0.5	U	0.5	U	1.5	U	47	U	110	U	104	UU	550	
MW-531	07/26/17	0.6		NA		NA		NA		46	U	95	U	100	U	168	
MW-531	03/20/18	0.2	U	NA		NA		NA		45	U	50	U	100	U	98	UU
MW-531	06/27/18	0.5	U	NA		NA		NA		46	U	50	U	100	U	98	UU
MW-531	09/17/18	0.5	U	NA		NA		NA		50	U	19	U	110	U	90	UU
MW-531	11/27/18	0.5	U	NA		NA		NA		47	U	19	U	100	U	83	UU
MW-532	06/29/12	NA		NA	NA	NA	NA	41		50	U	68	U	100		552	
MW-532	12/14/12	0.2	U	NA		NA		48		50	U	140		213		523	
MW-532	06/26/13	NA		NA	NA	NA	NA	29	U	50	U	67	U	73	UU	574	
MW-532	12/17/13	0.2	U	NA		NA		30	U	50	U	69	U	75	UU	572	
MW-532	06/17/14	NA		NA	NA	NA	NA	29	U	50	U	67	U	73	UU	574	
MW-532	12/09/14	0.2		NA		NA		36		50	U	66	U	94		555	
MW-532	06/23/15	NA		NA	NA	NA	NA	28	U	50	U	66	U	72	UU	575	
MW-532	10/24/16	0.5	U	0.5	U	0.5	U	1.5	U	450		110		650		527	
MW-532	07/26/17	0.5	U	NA		NA		380		50	U	110	U	460		510	
MW-532	03/20/18	0.2	U	NA		NA		46	U	50	U	100	U	98	UU	553	

Table 3-4  
 Summary of Groundwater Analytical Data  
 Petroleum and Polynuclear Aromatic Hydrocarbons  
 Former Unocal Edmonds Bulk Fuel Terminal  
 11720 Unoco Road  
 Edmonds, Washington

Monitoring Well	Date Sampled	BTEX <sup>1</sup> (µg/L)				Total cPAHs Adjusted for Toxicity <sup>2</sup> (µg/L)		Diesel <sup>3</sup> (µg/L)	Gasoline <sup>4</sup> (µg/L)	Heavy Oil <sup>3</sup> (µg/L)	TPH <sup>5</sup> (µg/L)	TPH CUL <sup>6</sup> (µg/L)								
		B	T	E	X	CUL=0.05														
		CUL=16	--	--	--	CUL=0.05	--													
MW-532	06/27/18	0.5	U	NA	NA	NA	NA	0.008	UU	46	U	50	U	100	U	98	UU	553		
MW-532	09/17/18	0.5	U	NA	NA	NA	NA	0.008	UU	48	U	19	U	110	U	89	UU	521		
MW-532	11/27/18	0.5	U	NA	NA	NA	NA	0.008	UU	46	U	19	U	100	U	83	UU	523		
MW-8R*	10/21/08	0.505		0.50	U	0.50	U	1.00	U	243	U	145	JZ	485	U	509		560		
MW-8R*	12/09/08	0.51		0.50	U	0.50	U	1.00	U	240	U	97.1		481	U	458		543		
MW-8R*	02/23/09	0.5	U	NA		NA		NA		68	U	50	U	70	U	128		540		
MW-8R*	04/21/09	0.5	U	NA		NA		NA		29	U	50	U	67	U	88		560		
MW-8R*	06/23/09	0.5	U	NA		NA		NA		49	U	50	U	67	U	108		548		
MW-8R*	08/18/09	0.5	U	NA		NA		NA		62	U	50	U	66	U	120		542		
MW-8R*	10/26/09	0.5	U	NA		NA		NA		300	U	50	U	66	U	358		513		
MW-8R*	01/19/10	NA		NA		NA		NA		34	U	50	U	67	U	93		556		
MW-8R* (Duplicate)	01/19/10	NA		NA		NA		NA		32	U	50	U	68	U	91		557		
MW-8R*	04/20/10	NA		NA		NA		NA		28	U	50	U	66	U	72	UU	575		
MW-8R*	07/20/10	NA		NA		NA		NA		79	U	50	U	67	U	138		537		
MW-8R*	10/26/10	0.5	U	NA		NA		NA	0.013	UU	440	U	50	U	77	U	504	509		
MW-8R*	03/22/11	NA		NA		NA		NA		28	U	50	U	66	U	72	UU	575		
MW-8R* (Duplicate)	03/22/11	NA		NA		NA		NA		32	U	50	U	67	U	91		558		
MW-8R*	06/15/11	NA		NA		NA		NA		44	U	50	U	67	U	103		550		
MW-8R*	09/27/11	NA		NA		NA		NA		30	U	50	U	70	U	75	UU	571		
MW-8R*	12/14/11	0.2	U	NA		NA		NA	0.007	UU	28	U	50	U	66	U	72	UU	575	
MW-8R*	03/28/12	NA		NA		NA		NA		29	U	50	U	67	U	73	UU	574		
MW-8R*	06/28/12	NA		NA		NA		NA		30	U	50	U	70	U	75	UU	571		
MW-8R* (Duplicate)	06/28/12	NA		NA		NA		NA		30	U	50	U	71	U	76	UU	571		
MW-8R*	09/26/12	NA		NA		NA		NA		31	U	50	U	73	U	77	UU	569		
MW-8R*	12/14/12	0.2	U	NA		NA		NA	0.008	UU	28	U	50	U	66	U	72	UU	575	
MW-8R*	03/26/13	NA		NA		NA		NA		28	U	50	U	66	U	72	UU	575		
MW-8R*	06/25/13	NA		NA		NA		NA		29	U	50	U	67	U	73	UU	574		
MW-8R*	09/25/13	NA		NA		NA		NA		30	U	50	U	69	U	75	UU	572		
MW-8R*	12/17/13	0.2	U	NA		NA		NA	0.008	UU	30	U	50	U	70	U	75	UU	571	
MW-8R*	03/27/14	NA		NA		NA		NA		29	U	50	U	67	U	73	UU	574		
MW-8R*	06/18/14	NA		NA		NA		NA		29	U	50	U	67	U	73	UU	574		
MW-8R* (Duplicate)	06/18/14	NA		NA		NA		NA		28	U	50	U	66	U	72	UU	575		
MW-8R*	09/30/14	NA		NA		NA		NA		31	U	50	U	73	U	77	UU	569		
MW-8R*	12/10/14	0.2		NA		NA		NA	0.008	UU	28	U	50	U	66	U	72	UU	575	
MW-8R*	03/25/15	NA		NA		NA		NA		29	U	50	U	68	U	74	UU	573		
MW-8R*	06/23/15	NA		NA		NA		NA		28	U	50	U	66	U	72	UU	575		
MW-8R*	10/24/16	0.5	U	0.5	U	0.5	U	1.5	U	0.008	UU	46	U	50	U	100	U	98	UU	553
MW-8R*	07/25/17	0.5	U	NA		NA		NA		45	U	50	U	100	U	98	UU	553		
MW-8R*	03/20/18	0.2	U	NA		NA		NA	0.008	UU	48	U	50	U	110	U	104	UU	550	
MW-8R*	06/29/18	0.5	U	NA		NA		NA	0.008	UU	47	U	50	U	100	U	99	UU	553	
MW-8R*	09/18/18	0.5	U	NA		NA		NA	0.008	UU	47	U	19	U	100	U	83	UU	522	
MW-8R*	11/29/18	0.5	U	NA		NA		NA	0.008	UU	48	U	19	U	110	U	89	UU	521	
MW-533	03/20/18	0.2	U	NA		NA		NA	0.008	UU	47	U	50	U	100	U	99	UU	553	
MW-533	06/27/18	0.5	U	NA		NA		NA	0.008	UU	45	U	50	U	100	U	98	UU	553	
MW-533	09/17/18	0.5	U	NA		NA		NA	0.008	UU	50	U	19	U	110	U	90	UU	521	
MW-533 (Duplicate)	09/17/18	0.5	U	NA		NA		NA	0.008	UU	49	U	19	U	110	U	89	UU	521	
MW-533	11/27/18	0.5	U	NA		NA		NA	0.008	UU	45	U	19	U	100	U	82	UU	523	
MW-534	03/20/18	0.2	U	NA		NA		NA	0.008	UU	45	U	50	U	100	U	98	UU	553	
MW-534	06/27/18	0.5	U	NA		NA		NA	0.008	UU	46	U	50	U	100	U	98	UU	553	
MW-534	09/17/18	0.5	U	NA		NA		NA	0.008	UU	47	U	19	U	100	U	83	UU	522	
MW-534	11/28/18	0.5	U	NA		NA		NA	0.008	UU	46	U	19	U	100	U	83	UU	523	
MW-534 (Duplicate)	11/28/18	0.5	U	NA		NA		NA	0.008	UU	50	U	19	U	110	U	90	UU	521	
MW-535	03/20/18	0.2	U	NA		NA		NA	0.008	UU	45	U	50	U	100	U	98	UU	553	
MW-535 (Duplicate)	03/20/18	0.2	U	NA		NA		NA	0.008	UU	46	U	50	U	100	U	98	UU	553	
MW-535	06/27/18	0.5	U	NA		NA		NA	0.008	UU	48	U	50	U	110	U	104	UU	550	
MW-535 (Duplicate)	06/27/18	0.5	U	NA		NA		NA	0.008	UU	49	U	50	U	110	U	105	UU	549	

Table 3-4  
 Summary of Groundwater Analytical Data  
 Petroleum and Polynuclear Aromatic Hydrocarbons  
 Former Unocal Edmonds Bulk Fuel Terminal  
 11720 Unoco Road  
 Edmonds, Washington

Monitoring Well	Date Sampled	BTEX <sup>1</sup> (µg/L)				Total cPAHs Adjusted for Toxicity <sup>2</sup> (µg/L)	Diesel <sup>3</sup> (µg/L)	Gasoline <sup>4</sup> (µg/L)	Heavy Oil <sup>3</sup> (µg/L)	TPH <sup>5</sup> (µg/L)	TPH CUL <sup>6</sup> (µg/L)
		B	T	E	X						
		CUL=16	--	--	--						
MW-535	09/17/18	0.5 U	NA	NA	NA	0.008 UU	49 U	19 U	110 U	89 UU	521
MW-535	11/27/18	0.5 U	NA	NA	NA	0.008 UU	46 U	19 U	100 U	83 UU	523
MW-E	07/26/17	0.5 U	NA	NA	NA	0.018	1500	260	100 U	1,810	528
MW-E-R	03/20/18	0.2 U	NA	NA	NA	0.008 UU	45 U	410	100 U	483	734
MW-E-R	06/27/18	0.5 U	NA	NA	NA	0.008 UU	59	510	110 U	624	721
MW-E-R	09/17/18	0.5 U	NA	NA	NA	0.008 UU	280	590	100 U	920	658
MW-E-R	11/27/18	0.5 U	NA	NA	NA	0.012	640	460	110 U	1,155	588
MW-E-R	02/07/19	0.2 J	NA	NA	NA	0.008	450	350	100 U	850	591
MW-E-R (Duplicate)	02/07/19	0.2 J	NA	NA	NA	0.008	300	380	100 U	730	621

**Notes:**

<sup>1</sup>B= benzene, T= toluene, E= ethylbenzene, X= xylenes. BTEX analyzed by EPA Method 8021B.

<sup>2</sup>cPAHs = Carcinogenic Polynuclear Aromatic Hydrocarbons. Analyzed by EPA Method 8270C-HVI. cPAHs adjusted for toxicity according to WAC 173-340-708(8) and Air Toxics Hot Spots Program Risk Assessment Guidelines, Part II Technical Support Document for Describing Available Cancer Potency Factors. Office of Environmental Health Hazard Assessment, California EPA. May 2005. If one or more adjusted cPAH constituents were reported as Non-Detect, half of the reporting limit was used in calculations.

<sup>3</sup>Diesel and Heavy Oil (Lube) analyzed by method NWTPH-D Extended.

<sup>4</sup>Gasoline analyzed by method NWTPH-G.

<sup>5</sup>TPH = Total petroleum hydrocarbons. TPH calculated by summing the concentrations of gasoline, diesel and heavy oil. For results which did not exceed method reporting limits, half of the reporting limit was added to determine TPH.

-- = not applicable

<sup>6</sup> Sample specific TPH CULs are developed by setting a hazard index for all TPH mixtures (GRO, DRO, HO) to 1, and adjusting the compositions relative to their mixtures and MTCA A CULs for groundwater. The calculation used is from Section 5.3 of the Interim Action Report (SLR, 2007) and is as follows: TPH CUL = 1/(%GRO/800+%DRO/500+%HO/500). For constituents that are less than detection limits, half of the detection limit was used in the calculation.

(µg/L) = micrograms per liter.

CUL = Cleanup level.

EPA = Environmental Protection Agency.

\* = Denotes perimeter wells.

[ ] = Bracketed data indicate duplicate samples.

Highlighted cell = Exceeds site specific CUL.

Shaded values indicate the most recent sampling event.

LNAPL = Light non-aqueous phase liquid.

NA = Not Analyzed.

<sup>DB2</sup> = Wells located within the DB-2 excavation footprint and decommissioned during the construction work related to DB-2 excavation activities in August 2017.

**Lab Qualifiers**

**Definition**

D	Compound quantitated using a secondary dilution.
J	Indicates an estimated value.
JX	Results in the diesel organic range are primarily due to overlap from a gasoline range product.
JZ	Detected hydrocarbons in the gasoline range appear to be due to overlap of diesel range hydrocarbons.
U	The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
UU	The compound was analyzed for but not detected. The associated value is the estimated compound quantitation limit.
UU	The constituents making up the total are all non-detects.
W	Due to excessive foaming of the sample, normal reporting limits were not attained.
XX	Sample was collected as part of a matrix spike/ matrix spike duplicate (MS/MSD). Anomalous detection of HO was re-analyzed. The sample extract was re-injected and confirmed the reported results. The sample was re-extracted past

Table 3-5  
 Summary of Groundwater Analytical Data  
 Natural Attenuation Parameters  
 Former Unocal Edmonds Bulk Fuel Terminal  
 11720 Unoco Road  
 Edmonds, Washington

Monitoring Well	Date Sampled	Temperature (°F) <sup>1</sup>	pH <sup>1</sup>	Conductivity (µS/cm) <sup>1</sup>	DO (mg/L) <sup>1</sup>	ORP (mV) <sup>1</sup>	Total Alkalinity (mg/L as CaCO <sub>3</sub> ) <sup>2</sup>	Sulfate (mg/L) <sup>3</sup>	Nitrate (mg/L) <sup>3</sup>	Methane (µg/L) <sup>4</sup>	Manganese (mg/L) <sup>5</sup>	Ferrous Iron by Field Measurement (mg/L) <sup>6</sup>
LM-2	10/23/08	57.54	3.51	17,373.54	0.39	222.94	5 U	914	1 UJ	28.1	0.349	4.0
LM-2	12/11/08	53.17	3.89	13,859.08	0.17	338.86	5 U	942	0.2 U	46.9	0.358	5.0
LM-2	02/26/09	49.78	3.82	12,912.70	1.62	371.08	0.46 U	915	0.250 U	59	0.367	3.2
LM-2	04/23/09	51.06	4.91	11,367.56	7.37	133.42	9.7	768	0.250 U	50	0.298	6.0
LM-2	06/25/09	55.63	5.36	17,476.72	3.18	-38.23	43.4	1,280	0.640	41	0.239	6.0
LM-2	08/20/09	60.42	6.03	23,943.90	5.43	-93.49	90.6	2,220	0.250 UW	25 P	0.277	6.0
LM-2	10/30/09	56.50	4.16	5,546.90	0.91	325.52	30.2	401	0.250 U	15	0.292	7.5
LM-2	10/29/10	59.54	5.27	12,292.11	1.08	27.03	90.4	385	5.000 U	760	0.196	5.2
LM-2	12/16/11	49.80	4.12	17,054.02	0.85	370	460 U	829	0.250 U	85	0.309	3.4
LM-2	12/18/12	50.34	4.98	14,232.66	1.15	112	35.9	652	0.250 U	2,300	0.263	5.5
LM-2	12/18/13	50.45	6.08	6,670.25	0.23	-39.01	43	337	0.250 U	1,800	0.213	6.0
LM-2	12/09/14	54.22	6.02	15,451.56	0.43	-191.87	101	563	0.250 U	1,700	0.569	>10
LM-2	07/26/17	64.92	6.29	4,426.9	0.07	-79.2	NA	10.0	0.250 U	5,600	0.184	10
LM-2	03/20/18	53.75	6.26	6,640.4	0.48	-14.5	NA	NA	NA	NA	NA	NA
LM-2	06/27/18	61.84	6.22	6,198.0	0.31	-71.0	NA	133.0	0.250 U	670	0.162	6
LM-2	11/27/18	55.99	6.02	4,512.3	0.01	-101.5	NA	93.2	0.25 U	640	0.097	7.0
MW-101	10/22/08	59.63	6.13	2,773.56	0.19	64.36	42	96.2	0.21	170	1.33	3.6
MW-101	12/10/08	55.79	5.99	1,807.60	0.41	132.69	50	41	0.45	708	3.32	2.2
MW-101	02/24/09	43.38	6.32	870.43	0.78	49.88	110	70.6	0.39	3,000	2.38	2.4
MW-101	04/22/09	49.80	6.19	452.57	3.79	24.22	83	83.3	0.98	300	0.977	1.0
MW-101	06/25/09	57.14	6.10	901.96	1.65	129.31	56	135	0.250 U	71	1.55	0.5
MW-101	08/20/09	64.03	6.15	1,864.72	0.66	48.55	75.8	110	0.250 UW	250 P	2.98	6.0
MW-101	10/27/09	59.81	6.11	877.98	1.56	141.54	101	37.5	1.20	1.7	0.185	0.5
MW-101	10/27/10	59.43	6.12	3,096.41	2.12	-48.48	108	107	0.250 U	200	1.33	5.0
MW-101	12/14/11	54.44	6.54	1,095.90	0.95	100	130	35.3	0.910	320	0.0501	0.0
MW-101	12/18/12	52.84	6.63	180.44	9.59	119.91	109	16.3	1.300	3 U	0.0012	0.0
MW-101	12/20/13	52.58	6.22	1,631.96	1.43	94.46	203	9.7	0.490	2,600	0.0509	0.0
MW-101	12/10/14	56.57	6.65	347.63	5.55	135.62	90	20	1.800	25	0.0013	0.0
MW-101	07/25/17	58.75	6.50	445.74	2.28	116.9	NA	38.5	0.250 U	8.5	0.043	0.25
MW-101* (Duplicate)	07/25/17	--	--	--	--	--	--	33.7	0.290	9.8	0.036	--
MW-101	03/22/18	50.41	6.61	246.3	5.94	114.5	NA	NA	NA	NA	NA	NA
MW-101	06/28/18	57.72	6.81	440.3	0.34	77.8	NA	10.2	0.450	320	0.065	0
MW-101	11/28/18	57.30	7.00	1,463.0	0.69	-63.7	NA	3.9	0.25 U	4,100	2.220	6.0
MW-104	10/22/08	58.72	6.26	2,428.46	-0.01	-13.09	35.6	66.6	0.200 U	594	1.02	4.0
MW-104	12/10/08	55.07	6.24	982.41	0.22	30.53	53.8	23.1	0.200 U	1,160	1.13	3.0
MW-104	02/24/09	49.93	6.08	967.89	0.21	-26.14	58.8	17	0.250 U	2,200	1.19	3.2
MW-104	04/23/09	48.22	6.23	566.34	1.01	-121.29	59.2	60.2	0.73	1,800	0.959	4.0
MW-104	06/24/09	58.33	6.34	506.78	0.21	-62.91	63.9	39.2	0.25 U	1,200	0.714	6.0
MW-104	08/19/09	62.87	6.32	1,353.13	0.29	-61.28	75.6	45	0.25 U	950	0.901	6.0
MW-104	10/27/09	60.10	6.12	2,590.00	0.43	-27.46	110	92.4	0.3	3,200	1.4	4.5
MW-104	10/27/10	58.17	6.16	1,640.32	0.04	-86.19	95.1	31.2	0.25 U	1,300	1.3	2.1
MW-104	12/13/11	53.28	6.19	863.19	0.14	-10.00	112	52.8	0.53 U	1,700	0.765	3.0
MW-104	12/18/12	50.70	6.35	229.74	3.31	197.61	96.4	17.2	1.6	37	0.061	1.0

**Table 3-5**  
**Summary of Groundwater Analytical Data**  
**Natural Attenuation Parameters**  
**Former Unocal Edmonds Bulk Fuel Terminal**  
**11720 Unoco Road**  
**Edmonds, Washington**

Monitoring Well	Date Sampled	Temperature (°F) <sup>1</sup>	pH <sup>1</sup>	Conductivity (µS/cm) <sup>1</sup>	DO (mg/L) <sup>1</sup>	ORP (mV) <sup>1</sup>	Total Alkalinity (mg/L as CaCO <sub>3</sub> ) <sup>2</sup>	Sulfate (mg/L) <sup>3</sup>	Nitrate (mg/L) <sup>3</sup>	Methane (µg/L) <sup>4</sup>	Manganese (mg/L) <sup>5</sup>	Ferrous Iron by Field Measurement (mg/L) <sup>6</sup>
MW-104	12/17/13	53.92	6.17	323.93	0.13	-66.63	108	18.3	0.3	980	0.287	0.12
MW-104	12/09/14	56.77	6.36	358.53	0.06	11.37	109	26	0.250 U	1,300	0.367	0.6
MW-104	07/26/17	60.48	6.53	360.84	0.18	17.2	NA	6.8	0.250 U	440	0.254	2.5
MW-104	03/20/18	50.34	--	--	10.31	--	NA	NA	NA	NA	NA	NA
MW-104	06/27/18	59.74	6.47	506.2	0.21	-192.3	NA	13.0	0.250 U	280	0.339	1
MW-104	11/27/18	58.81	6.71	632.56	0.02	-108.7	NA	7.4	0.25 U	960	0.380	3.5
MW-108	10/23/08	53.88	6.26	14,851.80	0.20	-83.53	509	373	1 UJ	2,390 D	0.208	1.4
MW-108	12/11/08	50.51	6.29	14,241.04	0.01	-184.14	557	288	0.200 U	1,410 D	0.242	1.2
MW-108	02/26/09	50.02	6.28	15,209.47	0.19	-268.28	549	456	0.250 U	3,000	0.263	3.0
MW-108	04/23/09	49.14	6.36	14,218.55	0.02	-270.38	517	315	0.250 U	2,400	0.278	3.0
MW-108	06/25/09	54.05	6.30	15,829.18	0.72	-132.71	486	507	0.52	2,100	0.284	4.5
MW-108	08/20/09	56.41	6.31	16,788.72	0.07	-158.78	525	401	0.25 UW	3,500	0.254	2.0
MW-108	10/30/09	55.36	6.31	18,050.49	0.12	-88.09	495	566	0.25 U	2,100	0.267	5.0
MW-108	10/29/10	54.88	6.31	23,517.97	0.02	-260.17	475	508	5 U	1,600	0.191	1.2
MW-108	12/16/11	51.90	6.27	20,084.25	0.07	-110.00	356	426	0.25 U	1,100	0.318	2.0
MW-108	12/18/12	45.21	6.17	12,903.42	0.63	-156.33	376	391	0.25 U	1,000	0.141	2.7
MW-108	12/19/13	50.97	6.51	21,819.37	-0.03	-267.22	545	381	0.25 U	2,100	0.124	0.2
MW-108	12/09/14	55.06	6.49	22,617.16	0.04	-321.05	605	404	0.250 U	3300	0.107	1.0
MW-109	10/23/08	54.91	6.22	16,332.14	1.34	-194.55	342	693	1 UJ	785	1.59	0.6
MW-109	12/12/08	51.03	6.29	12,565.11	0.80	-193.01	291	640	0.200 U	560	0.528	0.2
MW-109	02/26/09	47.82	6.38	13,623.75	3.97	-179.39	300	993	0.250 U	820	1.21	0.4
MW-109	04/23/09	47.97	6.03	8,713.56	1.84	-192.93	316	546	0.250 U	350	1.58	1.0
MW-109	06/25/09	54.17	6.21	22,124.79	0.52	-138.25	202	1,660	1.4	570	1.09	3.0
MW-109	08/20/09	55.99	6.37	23,873.46	2.33	-155.34	331	1,540	0.25 UW	320 P	1,650	1.0
MW-109	10/30/09	55.51	6.00	14,892.73	0.76	-41.77	332	1,200	0.25 U	400	1.38	1.0
MW-109	10/29/10	54.34	6.54	23,528.21	3.14	-262.04	348	824	0.25 U	420	1.93	0.1
MW-109	12/16/11	50.80	6.35	13,573.50	1.60	-120.00	259	597	0.25 U	310	1.58	1.6
MW-109	12/18/12	46.13	5.94	3,373.44	1.39	-92.39	153	193	0.250 U	390	0.381	3.1
MW-109	12/19/13	49.84	6.70	22,150.19	6.62	-204.45	440	547	0.25 U	160	1.84	0.0
MW-109	12/09/14	54.73	6.63	14,320.49	6.42	-244.96	361	450	0.250 U	1300	1.520	0.2
MW-126	12/18/12	49.66	6.75	301.47	2.81	13.21	249	19.6	0.250 U	3.0 U	0.126	2.0
MW-126	12/17/13	50.04	6.69	666.12	1.75	48.55	264	39.1	0.280	3.0 U	0.294	3.0
MW-126	12/10/14	52.14	6.73	730.22	0.13	38.63	283	25.3	0.250 U	3.0 U	0.0592	0.0
MW-126	07/25/17	55.16	6.09	461.04	0.95	232.7	NA	33.2	0.250 U	3.0 U	0.008	0.95
MW-126	03/22/18	46.35	7.14	515.3	7.04	199.5	NA	NA	NA	NA	NA	NA
MW-126	06/29/18	53.45	6.72	487.1	0.49	164.3	NA	26.8	0.250 U	3 U	0.025	2
MW-126	11/30/18	52.38	7.09	514.46	10.25	136.1	NA	35.8	3.10	3.0 U	0.005 U	0.0
MW-126 (Duplicate)	11/30/18	NA	NA	NA	NA	NA	NA	43.5	3.60	3.0 U	0.005 U	NA
MW-129R	10/24/08	54.76	6.45	839.57	-0.02	-33.84	502	23.8	0.200 U	1,930	5.74	5.8
MW-129R	12/12/08	51.10	6.62	867.09	0.12	-76.86	469	91.6	0.200 U	1,600 D	10.3	5.4
MW-129R	02/27/09	47.80	6.50	836.19	0.18	-70.26	505	47.1	0.250 U	6,000	8.56	5.8
MW-129R	04/27/09	49.18	6.56	822.66	0.17	-116.70	485	60.4	0.250 U	10,000	8.21	10.0
MW-129R	06/26/09	54.44	6.54	1,301.40	0.07	-79.11	493	64.4	0.250 U	9,100	7.81	9.0

**Table 3-5**  
**Summary of Groundwater Analytical Data**  
**Natural Attenuation Parameters**  
**Former Unocal Edmonds Bulk Fuel Terminal**  
**11720 Unoco Road**  
**Edmonds, Washington**

Monitoring Well	Date Sampled	Temperature (°F) <sup>1</sup>	pH <sup>1</sup>	Conductivity (µS/cm) <sup>1</sup>	DO (mg/L) <sup>1</sup>	ORP (mV) <sup>1</sup>	Total Alkalinity (mg/L as CaCO <sub>3</sub> ) <sup>2</sup>	Sulfate (mg/L) <sup>3</sup>	Nitrate (mg/L) <sup>3</sup>	Methane (µg/L) <sup>4</sup>	Manganese (mg/L) <sup>5</sup>	Ferrous Iron by Field Measurement (mg/L) <sup>6</sup>
MW-129R	08/21/09	57.58	6.58	1,013.56	0.06	-286.98	597	51.3	0.250 U	5,400	7.88	9.0
MW-129R	10/28/09	55.23	6.75	1,919.06	0.05	-161.96	1,150	1.7	0.250 U	15,000	5.22	8.0
MW-129R	11/01/10	55.53	6.58	1,397.48	0.10	-155.22	742	75.3	0.250 U	5,500	8.92	2.8
MW-129R	12/19/11	52.20	6.52	1,679.97	0.01	-110.00	1,000	25.2	0.250 U	11,000	7.00	5.0
MW-129R	12/18/12	51.77	6.60	1,485.27	0.29	-82.07	687	102	0.250 U	3900	10.3	5.0
MW-129R	12/18/13	52.41	6.73	1,113.53	0.08	-117.71	699	66.3	0.250 U	2,300	11.3	4.5
MW-129R	12/09/14	54.53	6.69	1,490.49	0.06	-134.58	710	11	0.05 U	5200	10.5	>10
MW-129R	07/26/17	58.59	6.64	1,435.1	0.11	-41.5	NA	112	0.250 U	4,200	8.270	7.0
MW-129R	03/20/18	50.15	6.71	1,376.5	0.11	-125.1	NA	NA	NA	NA	NA	NA
MW-129R	06/27/18	55.04	6.64	1,445.3	0.18	-188.1	NA	87.6	0.250 U	2,900	8.530	7
MW-129R	11/28/18	54.32	6.85	1,297.4	0.06	-127.7	NA	98.6	0.25 U	1,800	7.67	7.0
MW-134X	12/14/12	51.75	6.42	306.96	10.37	109.28	124	32.2	0.890	3.00 U	0.102	2.0
MW-134X	12/19/13	50.93	6.23	256.29	2.61	1.35	139	34	1.200	3 U	0.0	2.5
MW-134X	12/10/14	55.84	6.29	422.07	3.12	41.77	133	38	1.300	13	0.003	0.6
MW-135	10/27/08	54.94	6.51	1,848.03	-0.03	-60.48	959	4.12	0.200 U	10,800 D	2.68	4.0
MW-135	12/15/08	49.73	6.59	1,954.54	-0.09	-81.98	1070	1.43	0.200 U	7,170 D	2.69	2.2
MW-135	02/27/09	52.61	6.38	760.32	0.27	22.19	402	79.1	0.250 U	1,100	1.31	3.4
MW-135	04/24/09	50.76	6.48	649.63	0.13	-134.17	382	67.2	0.250 U	620	0.743	2.0
MW-135	06/29/09	51.44	6.47	1,319.24	1.09	-31.25	752	33	0.43	2,600	1.66	6.0
MW-135	08/24/09	53.02	6.56	2,049.88	0.29	-60.39	1140	6	0.250 U	11,000	1.67	7.0
MW-135	10/29/09	52.90	6.54	2,162.52	0.14	-87.07	1220	2.4	0.250 U	12,000	1.75	8.0
MW-135	11/01/10	54.37	6.46	2,818.70	0.06	-74.99	1160	1.5 U	0.250 U	12,000	1.24	5.6
MW-135	12/16/11	51.80	6.57	1,200.88	0.04	-20.00	425	101	0.250 U	250	0.37	7.0
MW-135	12/19/12	50.79	6.42	504.30	4.73	15.82	291	32.5	1.5	1,200	0.142	3.4
MW-135	12/20/13	50.87	6.50	1,914.40	0.03	549.43	1080	1.5 U	0.250 U	20,000	0.755	4.9
MW-135	12/12/14	54.03	6.36	818.48	1.44	-13.44	291	49	0.250 U	740	0.080	7.5
MW-136	10/27/08	53.88	6.34	2,330.80	0.06	-57.07	851	0.42	0.200 U	16,800 D	3.19	4.2
MW-136	12/15/08	46.47	6.31	1,092.68	0.17	-99.68	629	32.5	0.200 U	9,050 D	4.31	2.8
MW-136	02/27/09	47.97	6.34	990.82	0.43	-56.64	474	72.1	0.250 U	8,900	4.05	5.6
MW-136	04/24/09	49.91	6.41	925.24	0.07	-193.85	405	91.1	0.250 U	13,000	4.62	8.0
MW-136	06/29/09	51.53	6.43	975.31	0.37	-75.06	492	72.1	0.250 U	16,000	4.86	7.0
MW-136	08/24/09	54.28	6.43	1,020.67	0.14	-92.53	544	36.3	0.250 U	21,000	4.82	10.0
MW-136	10/29/09	53.78	6.35	981.76	0.25	-113.64	574	1.5 U	0.250 U	19,000	4.63	7.0
MW-136	11/01/10	54.50	6.44	1,147.64	0.05	-140.56	576	1.5 U	0.250 U	17,000	6.13	1.8
MW-136	12/16/11	51.90	6.43	2,964,572.75	-0.01	-94.97	523	2.8	0.250 U	20,000	12.6	2.0
MW-136	12/19/12	49.27	6.61	771.17	0.06	-216.79	416	14.8	0.250 U	8,200	10.2	7.0
MW-136	12/20/13	49.48	6.30	696.18	0.07	-202.27	488	1.5 U	0.250 U	25,000	12.9	6.0
MW-136	12/12/14	52.88	6.76	734.70	1.96	-54.76	405	5	0.250 U	10000	10.700	9.5
MW-139R	10/22/08	63.60	6.87	664.62	0.01	-22.31	243	64.8	0.200 U	864	2.48	1.0
MW-139R	12/10/08	54.36	6.96	708.71	0.78	15.38	167	76.1	0.2	12.5	0.902	0.5
MW-139R	02/25/09	43.11	7.06	334.12	3.34	136.11	105	53	0.4	5 U	0.115	0.4
MW-139R	04/23/09	47.34	7.08	180.00	1.66	-104.66	81.4	32.3	0.250 U	10 U	0.0102	0.4
MW-139R	06/25/09	62.38	7.14	365.34	0.50	-96.96	134	51.5	0.250 U	34	0.523	2.0

Table 3-5  
 Summary of Groundwater Analytical Data  
 Natural Attenuation Parameters  
 Former Unocal Edmonds Bulk Fuel Terminal  
 11720 Unoco Road  
 Edmonds, Washington

Monitoring Well	Date Sampled	Temperature (°F) <sup>1</sup>	pH <sup>1</sup>	Conductivity (µS/cm) <sup>1</sup>	DO (mg/L) <sup>1</sup>	ORP (mV) <sup>1</sup>	Total Alkalinity (mg/L as CaCO <sub>3</sub> ) <sup>2</sup>	Sulfate (mg/L) <sup>3</sup>	Nitrate (mg/L) <sup>3</sup>	Methane (µg/L) <sup>4</sup>	Manganese (mg/L) <sup>5</sup>	Ferrous Iron by Field Measurement (mg/L) <sup>6</sup>
MW-139R	08/20/09	69.85	7.10	439.97	0.22	-108.16	156	49.7	0.250 UW	77 P	0.512	1.0
MW-139R	10/28/09	60.58	6.95	277.93	1.41	71.75	110	37.5	0.250 U	5.2	0.0215	0.5
MW-139R	10/28/10	61.92	6.86	447.33	2.11	-69.41	185	60.4	0.250 U	52	0.189	1.0
MW-139R	12/15/11	51.33	6.99	258.44	2.69	70.00	114	35.2	0.250 U	5 U	0.027	0.0
MW-139R	12/18/12	49.36	6.93	258.61	4.11	196.75	85.2	16.3	0.260	3.0 U	0.0024	0.0
MW-139R	12/18/13	53.40	6.89	374.82	1.21	-103.26	139	33.8	0.250 U	5.6	0.0272	1.2
MW-139R	12/10/14	56.26	7.01	416.71	1.78	102.78	135	31	0.25 U	3 U	0.0185	0.1
MW-139R	07/27/17	63.47	6.88	467.67	0.29	--	NA	25.9	0.250 U	160	0.176	1.25
MW-139R	03/22/18	48.73	7.06	1,375.8	4.72	138.0	NA	NA	NA	NA	NA	NA
MW-139R	06/28/18	63.40	7.61	462.4	2.21	-92.5	NA	24.0	0.540	80	0.129	0
MW-139R	11/28/18	53.25	7.45	1,370.7	6.69	99.0	NA	58.4	1.70	3.0 U	0.005 U	0.0
MW-13U	12/14/12	23.38	33.19 <sup>A</sup>	53,946.56	2.96	-1,395.87	116	14.9	0.850	3.00 U	0.0019	0.0
MW-13U	12/20/13	52.45	6.25	181.31	2.40	-66.63	109	67.3	0.670	3.0 U	0.00073 U	0.0
MW-13U	12/10/14	57.94	6.48	281.43	3.25	147.77	104	16	0.950	3 U	0.001	0.0
MW-143	10/22/08	59.41	6.49	383.51	0.01	-49.00	142	34.4	0.200 U	2,210 D	1.26	5.4
MW-143	12/16/08	50.76	6.39	367.82	0.06	-73.14	194	12.9	0.200 U	7,630 D	3.82	3.2
MW-143	02/25/09	49.77	6.32	391.78	0.23	-61.12	229	1.5 U	0.250 U	18,000	4.47	4.2
MW-143	04/21/09	51.98	6.44	395.08	0.12	-167.60	220	1.8 U	0.250 U	17,000	4.28	5.8
MW-143	06/24/09	59.07	6.39	418.65	0.37	-130.39	210	1.5 U	0.250 U	15,000	3.67	6.0
MW-143	08/19/09	61.70	6.42	379.94	0.06	-84.88	182	9.1	0.250 U	4,100	1.86	2.0
MW-143	10/27/09	60.32	6.35	356.97	0.17	-144.82	154	14.5	0.360	4,900	0.868	6.5
MW-143	10/27/10	59.34	6.56	268.76	0.51	-174.12	68.5	55.7	0.250 U	620	0.214	3.0
MW-143	12/14/11	52.72	6.36	392.01	0.08	-81.55	229	1.5 U	0.250 U	19,000	4.01	5.5
MW-143	12/20/12	52.68	6.34	403.71	0.10	-76.85	244	1.5 U	0.250 U	17,000	4.37	5.3
MW-143	12/18/13	53.20	6.34	398.11	1.18	-41.69	206	1.5 U	0.250 U	22,000	3.7	4.6
MW-143	12/10/14	55.73	6.39	595.43	1.10	-63.38	227	2	0.25 U	19000	4.04	>10
MW-143	07/25/17	59.95	6.40	660.49	0.19	-55.3	NA	1.5 U	0.250 U	20,000	4.450	>7
MW-143	03/22/18	47.88	6.75	289.8	0.43	-83.0	NA	NA	NA	NA	NA	NA
MW-143	06/29/18	57.29	6.41	460.9	0.18	-96.6	NA	94.6	0.250 U	1,000	1.570	6
MW-143	11/30/18	55.58	6.41	318.03	0.06	-180.2	NA	1.5 U	0.25 U	6,200	1.14	7.0
MW-147	10/21/08	58.43	6.24	516.46	-0.02	-18.40	131	67.2	0.200 U	330	2.38	5.2
MW-147	12/09/08	52.49	6.42	692.37	0.18	-104.13	301	141	0.200 U	895	4.16	6.4
MW-147	02/23/09	49.80	6.42	776.76	0.12	-93.21	407	111	0.250 U	1,000	4.86	5.4
MW-147	04/21/09	50.50	6.50	629.49	0.09	634.02	334	86.9	0.250 U	1,500	4.08	6.0
MW-147	06/23/09	55.54	6.50	696.30	0.04	-108.35	393	49.6	0.250 U	340	3.92	7.0
MW-147	08/18/09	60.57	6.46	605.85	0.06	-45.34	272	74.2	0.250 U	610	3.01	7.0
MW-147	10/26/09	58.00	6.35	518.53	0.10	-41.83	205	84.6	0.250 U	890	3.26	8.0
MW-147	10/26/10	56.07	6.34	426.81	0.20	-74.33	162	83.6	0.250 U	340	2.96	5.2
MW-147	12/13/11	52.52	5.99	440.75	0.12	-13.48	181	134	0.640	15	2.61	1.6
MW-147	12/14/12	52.59	6.05	399.49	3.72	141.88	147	144	0.250 U	5.40	3.61	3.6
MW-147	12/17/13	53.28	6.05	510.40	0.31	147.70	145	189	0.290	36	2.13	1.0
MW-147	12/09/14	52.65	5.95	466.27	4.61	229.44	92.3	136	0.250 U	3 U	1.190	0.1
MW-149R	10/21/08	58.41	6.56	521.83	0.09	-34.31	225	52.5	0.200 U	1,610 D	0.963	1.6



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**11720 Unoco Road**  
**Edmonds, Washington**

Monitoring Well	Date Sampled	Temperature (°F) <sup>1</sup>	pH <sup>1</sup>	Conductivity (µS/cm) <sup>1</sup>	DO (mg/L) <sup>1</sup>	ORP (mV) <sup>1</sup>	Total Alkalinity (mg/L as CaCO <sub>3</sub> ) <sup>2</sup>	Sulfate (mg/L) <sup>3</sup>	Nitrate (mg/L) <sup>3</sup>	Methane (µg/L) <sup>4</sup>	Manganese (mg/L) <sup>5</sup>	Ferrous Iron by Field Measurement (mg/L) <sup>6</sup>
MW-149R	12/09/08	52.55	6.22	466.01	0.17	101.87	117	165	0.200 U	224	1.06	0.6
MW-149R	02/23/09	48.40	6.43	441.39	0.09	82.90	161	133	0.250 U	420	0.507	0.6
MW-149R	04/21/09	48.99	6.37	329.88	1.25	589.02	115	117	0.71	60	0.216	0.2
MW-149R	06/23/09	56.35	6.56	556.71	0.01	15.84	217	118	0.250 U	860	0.338	3.0
MW-149R	08/18/09	62.17	6.56	643.81	0.15	-22.07	256	121	0.250 U	1,100	0.48	3.0
MW-149R	10/26/09	58.37	6.21	404.24	3.57	203.93	76.4	160	1.600	7.9	0.0113	1.0
MW-149R	10/26/10	57.49	6.36	501.89	0.55	50.72	150	135	0.770	28	0.14	0.5
MW-149R	12/13/11	50.53	6.39	277.74	0.67	210.00	79.1	122	1.6	5 U	0.0163	0.0
MW-149R	12/14/12	49.79	6.42	442.76	5.35	227.31	154	172	0.770	3.00 U	0.0074	0.5
MW-149R	12/17/13	51.91	6.32	446.22	0.22	150.77	83.2	128	1.5	3 U	0.0051	1.0
MW-149R	12/09/14	51.67	6.41	306.80	5.37	258.01	84.7	57	1.800	3 U	0.001	0.1
MW-150	10/21/08	58.35	6.52	748.62	-0.05	25.37	444	68.7	0.200 U	622	1.52	1.4
MW-150	12/09/08	52.71	6.54	761.44	0.20	32.64	440	134	0.200 U	389	1.52	1.8
MW-150	02/23/09	48.38	6.56	586.85	0.14	71.82	371	101	0.250 U	180	1.24	1.0
MW-150	04/21/09	48.86	6.69	570.05	0.15	-80.49	341	86.5	0.250 U	50	1.14	1.0
MW-150	06/23/09	57.16	6.77	569.79	0.27	31.03	347	60.8	0.250 U	220	0.945	1.0
MW-150	08/18/09	62.67	6.61	708.96	0.06	-5.64	403	69.3	0.250 U	350	1.24	1.8
MW-150	10/26/09	58.83	6.64	587.23	0.96	70.66	316	73	0.380	51	0.295	1.0
MW-150	10/26/10	58.28	6.34	2,521,506.50	0.60	33.14	347	63.6	1.1	110	0.812	1.8
MW-150	12/13/11	51.57	6.54	619.48	0.06	3.17	390	89.4	0.380	150	1.37	2.0
MW-150	12/14/12	51.94	6.59	409.93	0.48	101.66	263	41.1	0.250 U	26.0	0.179	0.0
MW-150	12/17/13	52.39	6.55	822.42	0.29	19.61	386	64.6	0.250 U	980	2.24	3.0
MW-150	12/09/14	54.45	6.39	591.47	1.31	235.42	309	54	0.250 U	280	0.440	0.1
MW-203	12/17/12	51.62	6.23	197.93	5.66	229.49	79.1	10.2	2.0	3.0 U	0.00083	NA
MW-203	12/19/13	48.13	6.33	143.10	4.97	2.03	80.7	9.2	1.9	3.0 U	0.0021	1.5
MW-203	12/10/14	53.67	6.35	233.78	5.29	130.18	77.1	11	2.300	3 U	0.001 U	0.1
MW-20R	10/22/08	55.85	6.68	10,026.36	0.15	-63.43	306	283	0.200 U	771	2.97	6.0
MW-20R	12/10/08	54.77	6.63	7,040.07	0.00	-88.61	263	238	0.200 U	886	1.63	4.0
MW-20R	02/24/09	49.87	6.89	2,668.49	0.11	-94.36	271	77.7	0.250 U	3,300	0.404	2.0
MW-20R	04/22/09	48.29	6.77	1,613.57	0.53	-71.76	250	33.6	0.250 U	2,800	0.293	5.5
MW-20R	06/24/09	54.32	6.73	6,859.37	0.44	-54.70	234	287	0.39	160	1.24	3.5
MW-20R	08/19/09	58.26	6.72	12,573.84	0.18	-122.78	229	592	0.250 U	900	2.49	6.0
MW-20R	10/27/09	57.49	6.43	11,374.52	0.61	-95.09	153	520	2.80	340	1.41	2.0
MW-20R	10/27/10	57.29	6.80	30,822.78	0.07	-143.50	128	1,710	1.2	51	0.839	2.6
MW-20R	12/14/11	53.47	6.56	10,515.91	-0.01	-39.92	220	566	0.250 U	1,400	0.488	2.6
MW-20R	12/17/12	51.84	5.76	177.51	7.57	236.30	39.9	63.6	0.250 U	3.0 U	0.127	0.5
MW-20R	12/18/13	53.27	6.72	6,772.63	0.07	-113.24	231	315	0.250 U	1,400	0.22	0.6
MW-20R	12/10/14	55.64	6.44	5,415.46	2.64	-208.01	129	232	0.25 U	140	0.116	0.1
MW-20R	07/26/17	58.29	6.51	17,957	3.14	40.8	NA	835	0.250 U	410	1.520	4.75
MW-20R	03/22/18	48.65	6.81	9,008.7	0.58	-13.0	NA	NA	NA	NA	NA	NA
MW-20R	06/29/18	55.83	7.05	9,558.1	0.17	-149.2	NA	344.0	0.250 U	160	0.526	2
MW-20R	11/29/18	55.71	6.84	12,493	1.48	-85.7	NA	426	0.25 U	80	0.354	1.5
MW-20R (Duplicate)	11/29/18	NA	NA	NA	NA	NA	NA	473	0.25 U	86	0.353	NA

Table 3-5  
Summary of Groundwater Analytical Data  
Natural Attenuation Parameters  
Former Unocal Edmonds Bulk Fuel Terminal  
11720 Unoco Road  
Edmonds, Washington

Monitoring Well	Date Sampled	Temperature (°F) <sup>1</sup>	pH <sup>1</sup>	Conductivity (µS/cm) <sup>1</sup>	DO (mg/L) <sup>1</sup>	ORP (mV) <sup>1</sup>	Total Alkalinity (mg/L as CaCO <sub>3</sub> ) <sup>2</sup>	Sulfate (mg/L) <sup>3</sup>	Nitrate (mg/L) <sup>3</sup>	Methane (µg/L) <sup>4</sup>	Manganese (mg/L) <sup>5</sup>	Ferrous Iron by Field Measurement (mg/L) <sup>6</sup>
MW-500	10/27/08	60.04	6.44	4,499.73	0.05	-10.17	977	172	0.200 U	8,590 D	0.97	4.2
MW-500	12/15/08	48.50	6.73	641.64	0.50	76.79	362	134	0.23	1,940 D	0.511	0.0
MW-500	02/27/09	44.74	6.77	475.25	0.29	111.07	334	37.7	0.250 U	6,400	0.2	1.2
MW-500	04/24/09	50.90	6.73	339.34	0.44	-143.85	263	18.6	0.250 U	39	0.0808	0.4
MW-500	06/29/09	59.99	6.38	1,001.85	-0.08	-44.59	464	17,900	0.250 U	16,000	1,340	3.0
MW-500	08/21/09	67.41	6.38	1,341.80	0.10	-233.97	647	2.20	0.250 U	15,000	1.82	2.5
MW-500	10/29/09	59.42	6.42	734.24	0.16	-104.24	362	131	0.350	13,000	1.97	1.5
MW-500	11/01/10	58.82	6.16	735.00	0.07	-145.52	451	22.4	0.250 U	12,000	1.8	5.5
MW-500	12/16/11	52.50	6.26	1,101,366.63	0.13	-103.35	175	4.3	0.250 U	9,400	0.344	5.2
MW-500	12/19/12	49.54	6.97	120.55	7.19	124.35	86.8	4.6	0.350	3 U	0.0012	0.6
MW-500	12/20/13	47.66	6.09	2,125.76	7.41	-25.52	401	1.5 U	0.250 U	19,000	1.38	0.14
MW-500	12/11/14	51.79	6.62	243.84	0.59	11.00	98.5	8	0.250 U	8400	0.100	0.2
MW-501	10/24/08	60.21	6.53	3,805.79	-0.02	-27.98	1,700	59.2	0.200 U	10,500 DJ	3.49	5.0
MW-501	12/15/08	51.44	6.66	475.85	4.55	91.22	269	55.4	1.73	91.9	0.0552	0.0
MW-501	03/02/09	49.42	6.49	434.37	2.35	216.95	317	34.7	1.2	56	0.67	0.8
MW-501	04/24/09	51.05	6.53	374.33	1.03	-42.42	248	29.7	0.250 U	140	0.694	1.0
MW-501	06/26/09	59.01	6.40	1,025.69	0.04	37.36	NA	12.6	0.250 U	16,000	2.8	0.0
MW-501	08/21/09	67.17	6.44	1,361.38	0.19	-47.09	752	2.7	0.250 U	13,000	5	7.0
MW-501	10/29/09	58.23	6.43	366.98	0.24	-105.85	242	26.1	0.250 U	380	4.9	5.0
MW-501	11/01/10	59.18	6.26	844.99	0.10	-102.31	509	1.5 U	0.250 U	14,000	4.95	7.2
MW-501	12/16/11	52.30	6.31	1,364,320.50	0.02	-162.31	219	5.8	0.250 U	1,400	1.65	4.2
MW-501	12/19/12	50.03	6.29	135.87	3.04	-19.66	82.5	3.0	0.250 U	220	0.0812	1.0
MW-501	12/20/13	46.25	6.22	352.27	0.51	80.35	247	11.2	0.250 U	17,000	2.45	5.5
MW-501	12/11/14	52.36	6.24	312.79	0.07	-115.67	118	4	0.250 U	4400	1.530	5.0
MW-502	10/24/08	59.77	6.31	558.51	0.05	-36.88	98	70.2	0.200 U	98.8 D	1.1	6.4
MW-502	12/12/08	53.20	6.36	482.08	0.04	-33.02	87.2	63.4	0.200 U	67	0.739	3.0
MW-502	02/25/09	48.02	6.37	343.38	0.11	-24.32	67.9	56.8	0.250 U	53	0.681	6.4
MW-502	04/22/09	50.96	6.36	314.18	0.03	226.34	67.7	48	0.250 U	40	0.635	7.0
MW-502	06/26/09	61.26	6.37	379.61	0.14	-57.95	95	52.8	0.250 U	33	0.627	6.5
MW-502	08/21/09	64.60	6.17	364.92	0.10	-38.59	107	27.6	0.250 U	20 P	0.585	6.0
MW-502	10/28/09	60.10	6.34	413.99	0.14	-65.94	153	41.4	0.250 U	45	0.568	6.0
MW-502	10/28/10	59.88	6.09	377.99	0.11	31.93	100	30.2	0.250 U	5.2	0.407	4.8
MW-502	12/16/11	53.40	6.12	280.64	0.05	127.40	84.3	31.4	0.250 U	5.7	0.244	0.8
MW-502	12/19/12	49.12	6.13	201.10	0.50	100.97	101	27.4	1.2	56	0.149	1.0
MW-502	12/20/13	50.47	6.26	431.25	0.10	33.60	79	34	0.250 U	3	0.355	3.6
MW-502	12/11/14	51.82	6.20	390.23	0.75	206.18	118	26	2.8	3 U	0.0724	0.1
MW-502	07/26/17	58.28	6.24	315.05	0.14	48.2	NA	29.1	0.250 U	3 U	0.258	4.25
MW-502 (Duplicate)	07/26/17	--	--	--	--	--	--	26.9	0.250 U	3 U	0.251	--
MW-502	03/21/18	48.61	6.54	283.9	0.06	50.7	NA	NA	NA	NA	NA	NA
MW-502	06/27/18	57.25	5.96	274.6	0.02	17.7	NA	23.0	0.250 U	5	0.247	3
MW-502	11/28/18	54.31	6.25	260.71	0.18	92.1	NA	19.2	2.40	3.0 U	0.208	1.5
MW-503	10/27/08	58.09	6.21	359.03	0.00	-44.22	189	8.44	0.200 U	478	0.139	3.0
MW-503	12/12/08	54.35	6.36	302.27	0.07	-38.20	169	9.51	0.200 U	306	0.188	4.6

Table 3-5  
 Summary of Groundwater Analytical Data  
 Natural Attenuation Parameters  
 Former Unocal Edmonds Bulk Fuel Terminal  
 11720 Unoco Road  
 Edmonds, Washington

Monitoring Well	Date Sampled	Temperature (°F) <sup>1</sup>	pH <sup>1</sup>	Conductivity (µS/cm) <sup>1</sup>	DO (mg/L) <sup>1</sup>	ORP (mV) <sup>1</sup>	Total Alkalinity (mg/L as CaCO <sub>3</sub> ) <sup>2</sup>	Sulfate (mg/L) <sup>3</sup>	Nitrate (mg/L) <sup>3</sup>	Methane (µg/L) <sup>4</sup>	Manganese (mg/L) <sup>5</sup>	Ferrous Iron by Field Measurement (mg/L) <sup>6</sup>
MW-503	02/26/09	50.47	6.29	280.63	0.12	-14.44	155	11.8	0.250 U	210		2.0
MW-503	04/22/09	51.85	6.36	273.33	0.02	259.93	152	12.3	0.250 U	150		7.0
MW-503	06/26/09	55.34	6.36	281.37	0.05	-56.57	156	16.3	0.250 U	190		6.5
MW-503	08/21/09	60.08	6.34	311.25	0.02	-37.47	158	11.7	0.250 U	180	P	7.0
MW-503	10/28/09	58.50	6.31	314.43	0.04	-44.90	159	12.1	0.250 U	190		10.0
MW-503	10/28/10	58.32	6.18	512.56	0.10	-23.74	145	14.9	0.250 U	180		5.6
MW-503	12/15/11	54.30	6.26	443.34	0.00	-17.75	137	24.2	0.250 U	130		5.2
MW-503	12/18/12	55.26	6.22	494.81	0.02	-90.25	155	37.8	0.250 U	100		1.0
MW-503	12/19/13	55.23	6.14	1,265.08	0.01	-23.91	145	40.3	0.250 U	74		5.2
MW-503	12/11/14	55.83	6.28	651.61	0.15	-21.99	142.0	38.5	0.250 U	61		9.5
MW-503	03/21/18	52.02	6.53	499.9	0.06	-50.4	NA	NA	NA	NA	NA	NA
MW-503	06/28/18	57.51	6.22	511.0	0.17	-69.8	NA	35.2	0.250 U	140		4
MW-503 (Duplicate)	06/28/18	--	--	--	--	--	--	33.5	0.250 U	140		--
MW-503	11/28/18	58.90	6.51	492.76	0.03	-90.4	NA	31.9	0.25 U	95		5.5
MW-504	10/24/08	58.92	6.73	1,157.92	0.08	5.06	435	64.2	0.200 U	1,970	D	0.8
MW-504	12/12/08	49.76	6.98	958.10	0.24	36.78	261	188	0.71	269		0.2
MW-504	02/27/09	46.92	7.04	572.72	0.28	473.30	251	119	0.4	120		0.2
MW-504	04/24/09	49.13	7.08	566.26	0.92	-47.37	227	129	0.71	56		0.2
MW-504	06/26/09	59.97	7.08	595.29	0.14	33.80	274	106	0.250 U	170		0.0
MW-504	08/21/09	66.52	6.88	797.96	0.04	28.06	338	84.7	0.250 U	840		0.0
MW-504	10/28/09	60.48	6.81	637.65	0.41	52.25	311	86.7	0.650	380		1.5
MW-504	10/28/10	60.75	6.76	786.39	0.73	-63.57	301	47.8	0.250 U	180		0.5
MW-504	12/16/11	54.30	6.83	412.10	0.96	153.17	225	66.3	0.250 U	170		0.0
MW-504	12/18/12	48.08	7.44	235.83	8.60	69.47	115.0	8.4	0.250 U	3.0	U	0.0015
MW-504	12/19/13	53.95	6.22	351.95	0.03	-40.96	223	17	0.250 U	700		2.0
MW-504	12/11/14	50.76	7.15	309.59	6.81	72.46	115	16	0.25 U	620		0.1
MW-504	07/26/17	62.32	6.84	420.98	0.10	46.3	NA	12.0	0.250 U	570		0.0
MW-504	03/21/18	49.63	7.14	1,911.50	4.41	73.8	NA	NA	NA	NA	NA	NA
MW-504	06/28/18	60.45	7.02	1,577.40	0.36	-54.7	NA	51.9	0.250 U	450		1.5
MW-504	11/28/18	54.44	7.06	839.44	9.20	43.2	NA	39	0.75	15		0.0
MW-505	10/24/08	56.61	6.77	1,292.49	0.42	23.88	289	119	0.54	961		0.6
MW-505	12/15/08	51.14	6.89	823.56	2.25	68.13	216	144	0.63	219		0.0
MW-505	02/27/09	46.85	6.85	659.23	2.72	182.77	181	167	0.39	130		0.0
MW-505	04/22/09	49.75	7.04	586.48	1.48	-144.75	184	134	0.43	100		0.0
MW-505	06/26/09	62.11	7.01	637.54	1.42	-17.29	190	133	0.34	190		0.5
MW-505	08/21/09	64.00	6.88	719.54	0.60	-15.81	185	72.9	0.25 U	190	P	1.0
MW-505	10/28/09	57.61	6.87	620.60	1.83	26.22	187	136	0.38	230		0.5
MW-505	10/29/10	59.58	6.75	613.95	0.05	-59.16	219	58.6	0.25 U	1,000		1.8
MW-505	12/15/11	53.63	6.77	530.14	0.65	0.00	245	92.3	0.25 U	390		1.2
MW-505	12/18/12	52.29	6.91	260.87	6.66	71.61	125	69.7	0.250 U	5.0		1.0
MW-505	12/19/13	53.04	6.25	1,300.95	0.01	-8.82	237	66.3	0.250 U	490		2.5
MW-505	12/11/14	52.91	6.87	328.26	5.83	138.69	97.8	21	0.25 U	460		0.2
MW-505	07/26/17	63.49	6.78	542.29	0.18	-19.6	NA	44.4	0.250 U	1,300		3.5

Table 3-5  
 Summary of Groundwater Analytical Data  
 Natural Attenuation Parameters  
 Former Unocal Edmonds Bulk Fuel Terminal  
 11720 Unoco Road  
 Edmonds, Washington

Monitoring Well	Date Sampled	Temperature (°F) <sup>1</sup>	pH <sup>1</sup>	Conductivity (µS/cm) <sup>1</sup>	DO (mg/L) <sup>1</sup>	ORP (mV) <sup>1</sup>	Total Alkalinity (mg/L as CaCO <sub>3</sub> ) <sup>2</sup>	Sulfate (mg/L) <sup>3</sup>	Nitrate (mg/L) <sup>3</sup>	Methane (µg/L) <sup>4</sup>	Manganese (mg/L) <sup>5</sup>	Ferrous Iron by Field Measurement (mg/L) <sup>6</sup>
MW-505	03/21/18	51.98	6.83	2,015.50	0.05	-98.7	NA	NA	NA	NA	NA	NA
MW-505	06/28/18	60.95	6.72	845.44	0.31	-96.3	NA	40.4	0.250 U	530	0.871	5.0
MW-505	11/28/18	53.45	6.88	2,024.6	3.27	-29.5	NA	83.2	0.25 U	480	1.520	4.5
MW-506	10/24/08	58.38	6.90	851.73	-0.03	-3.02	238	147	0.200 U	2,820 D	1.42	0.8
MW-506	12/12/08	49.85	6.88	863.65	0.35	52.81	186	90.7	0.21	1,770 D	1.61	0.4
MW-506	02/27/09	47.32	7.10	363.65	0.50	76.54	121	59.9	0.56	140	0.105	0.0
MW-506	04/24/09	48.74	7.12	272.22	0.56	-138.25	115	53.6	1	36	0.0139	0.0
MW-506	06/26/09	57.74	7.11	601.49	0.11	85.41	183	74.3	320	1,800	0.135	0.0
MW-506	08/21/09	62.46	7.06	329.13	0.07	46.69	141	28.1	0.25 U	2,200	0.434	0.5
MW-506	10/30/09	59.70	6.89	363.42	0.37	4.84	132	71.7	0.25 U	1,600	0.729	0.5
MW-506	10/29/10	58.82	6.83	518.80	0.09	-28.40	207	29.8	0.25 U	5,200	1.97	0.6
MW-506	12/15/11	52.57	7.04	283.39	0.15	38.13	183	36.1	0.85	140	0.273	0.0
MW-506	12/19/12	51.08	6.94	226.17	4.59	158.02	143	27.1	0.250 U	42	0.0897	0.0
MW-506	12/19/13	52.82	6.75	422.56	0.03	-38.21	192	17.8	0.25 U	2,700	2.15	1.0
MW-506	12/11/14	54.27	7.29	429.59	6.55	110.57	153	32	1	45	0.139	0.1
MW-506	07/27/17	59.29	6.98	416.24	0.12	92.70	NA	4.3	0.250 U	4900	1.6300	0.5
MW-506	03/21/18	49.25	7.17	499.96	0.16	-4.80	NA	NA	NA	NA	NA	NA
MW-506 (Duplicate)	03/21/18	--	--	--	--	--	NA	NA	NA	NA	NA	NA
MW-506	06/28/18	60.59	6.92	522.39	0.27	-86.9	NA	1.5 U	0.250 U	12,000	0.994	4.0
MW-506	11/28/18	57.09	6.86	587.37	0.57	-54.5	NA	19.8	0.25 U	12,000	1.180	3.0
MW-507	10/24/08	58.31	6.54	642.48	0.01	-93.26	214	80.7	0.200 U	1,110 D	5.1	6.0
MW-507	12/12/08	52.21	6.61	795.60	0.07	-46.04	297	151	0.200 U	850	3.31	3.8
MW-507	02/27/09	48.70	6.51	909.55	0.26	37.35	290	279	0.250 U	1,600	3.97	3.2
MW-507	04/24/09	51.10	6.53	992.50	0.14	-38.69	293	364	0.250 U	1,600	3.4	3.0
MW-507	06/26/09	56.60	6.52	1,350.93	0.03	-29.33	252	282	0.250 U	1,100	4.27	7.0
MW-507	08/21/09	61.75	6.48	964.71	0.20	-46.15	279	297	0.250 U	2,300	6.04	7.0
MW-507	10/28/09	59.50	6.59	1,034.93	0.38	-20.79	350	302	0.250 U	280	3.39	2.0
MW-507	10/29/10	59.85	6.62	1,097.89	0.36	-66.97	347	243	0.250 U	59	1.67	1.5
MW-507	12/16/11	54.20	6.65	843.34	0.21	113.30	307	314	0.250 U	150	1.4	0.8
MW-507	12/19/12	48.76	6.65	809.79	1.61	6.98	213	174	0.330	6.7	0.175	1.5
MW-507	12/19/13	53.46	6.55	1,087.97	0.08	-76.22	365	203	0.250 U	250	1.08	1.2
MW-507	12/11/14	53.84	6.62	863.67	3.13	-97.50	218	171	0.68	3 U	0.0288	0.1
MW-507	07/27/17	60.09	6.74	905.45	0.42	197.4	NA	142	0.250 U	22	0.746	1.75
MW-507 (Duplicate)	07/27/17	--	--	--	--	--	--	142	0.250 U	37	0.689	--
MW-507	03/21/18	49.19	6.99	799.40	2.63	283.0	NA	NA	NA	NA	NA	NA
MW-507	06/28/18	59.42	6.78	908.98	0.57	106.8	NA	162.0	0.250 U	100	0.197	0.0
MW-507	11/28/18	56.47	6.81	782.13	5.82	130.4	NA	144	2.40	3.9	0.084	0.5
MW-508	10/24/08	58.26	6.80	1,614.86	0.09	-18.99	430	141	0.200 U	1,630 D	0.248	0.4
MW-508	12/11/08	53.93	6.52	750.26	0.12	79.75	209	205	0.66	641	1.38	0.2
MW-508	02/26/09	48.90	6.40	786.61	0.22	-210.79	212	243	0.560	1,300	0.963	0.0
MW-508	04/23/09	49.87	6.29	882.52	0.22	-116.34	177	267	0.78	350	0.942	0.4
MW-508	06/26/09	57.68	6.54	949.43	0.18	-79.16	216	274	0.250 U	6,100	1,010	0.0
MW-508	08/21/09	61.65	6.39	1,031.70	0.21	-269.40	304	364	0.640	5,900	0.467	0.0

Table 3-5  
 Summary of Groundwater Analytical Data  
 Natural Attenuation Parameters  
 Former Unocal Edmonds Bulk Fuel Terminal  
 11720 Unoco Road  
 Edmonds, Washington

Monitoring Well	Date Sampled	Temperature (°F) <sup>1</sup>	pH <sup>1</sup>	Conductivity (µS/cm) <sup>1</sup>	DO (mg/L) <sup>1</sup>	ORP (mV) <sup>1</sup>	Total Alkalinity (mg/L as CaCO <sub>3</sub> ) <sup>2</sup>	Sulfate (mg/L) <sup>3</sup>	Nitrate (mg/L) <sup>3</sup>	Methane (µg/L) <sup>4</sup>	Manganese (mg/L) <sup>5</sup>	Ferrous Iron by Field Measurement (mg/L) <sup>6</sup>
MW-508	10/28/09	59.81	6.13	704.28	0.49	159.01	216	224	0.750	3,500	0.767	0.0
MW-508	10/28/10	60.58	6.25	740.35	1.00	-106.68	223	176	0.250 U	6,600	0.735	2.0
MW-508	12/15/11	54.52	6.41	723.53	0.01	-17.85	270	268	0.250 U	8,200	0.570	5.0
MW-508	12/19/12	54.39	6.18	554.34	0.11	4.78	228	188	0.290	5,900	0.696	4.0
MW-508	12/19/13	51.96	6.15	736.98	0.46	-70.89	246	171	0.250 U	2,600	0.395	4.0
MW-508	12/11/14	55.00	6.15	508.40	2.08	186.27	117	136	0.25 U	14	0.146	0.0
MW-508 <sup>DB2</sup>	07/27/17	63.35	6.49	596.45	0.12	-63.9	NA	2.3	0.250 U	6,800	1.040	6.5
MW-509	10/23/08	59.60	6.62	489.68	0.23	44.82	185	66	0.26	514	0.926	0.4
MW-509	12/11/08	50.47	6.83	445.56	1.34	113.25	90	66.2	1.92	52.5	0.45	0.4
MW-509	02/25/09	44.22	6.98	256.98	6.04	391.88	80.8	44.4	0.250 U	5 U	0.0127	0.2
MW-509	04/23/09	51.31	7.07	192.88	4.78	-52.52	74.8	40.6	0.250 U	10 U	0.0063	0.0
MW-509	06/25/09	64.34	6.98	321.70	0.12	-14.93	117	55.9	0.250 U	9	0.0996	0.5
MW-509	08/21/09	67.68	6.90	365.42	0.21	-268.87	129	38.9	0.250 U	120	0.365	0.5
MW-509	10/28/09	57.40	6.80	219.09	2.56	99.13	95.8	29.5	0.250 U	29	0.131	0.0
MW-509	10/28/10	59.45	6.71	387.07	0.40	68.41	128	43.5	0.250 U	20	0.113	0.4
MW-509	12/15/11	49.65	6.86	236.46	1.05	90	108	43.5	0.250 U	5 U	0.0413	0.0
MW-509	12/19/12	49.43	7.01	138.92	6.55	131.63	81.7	14.8	0.250 U	3 U	0.007	0.7
MW-509	12/19/13	49.66	6.79	225.92	0.62	144.66	184	50.4	0.250 U	240	0.222	0.0
MW-509	12/11/14	52.90	6.60	108.65	5.60	158.07	44.1	6	0.25 U	3 U	0.0168	0.1
MW-509	07/27/17	65.33	6.76	415.49	0.39	-3.6	NA	49.3	0.250 U	170	0.427	0.5
MW-509	03/21/18	48.85	8.65	0.38	11.36	148.3	NA	NA	NA	NA	NA	NA
MW-509	06/28/18	63.93	6.84	2,235.10	0.56	72.8	NA	73.1	0.250 U	12	0.168	0.0
MW-509	11/28/18	54.96	6.89	4,102.3	3.14	78.0	NA	193	1.40	50	0.057	0.0
MW-510	10/23/08	57.02	6.60	942.28	0.16	-1.59	512	9.78	0.200 U	7,480 D	0.221	1.2
MW-510	12/11/08	52.98	6.60	795.47	0.28	-81.60	468	12	0.200 U	3,990 D	0.483	1.4
MW-510	02/26/09	47.88	6.42	873.63	0.10	-55.76	468	17	0.250 U	9,700	2.32	1.6
MW-510	04/27/09	50.18	6.44	851.95	0.17	-181.81	437	21.2	0.250 U	11,000	2.46	7.0
MW-510	06/24/09	58.28	6.64	918.04	0.14	-123.30	475	10.1	0.250 U	14,000	1.11	6.0
MW-510	08/20/09	62.64	6.60	937.57	0.06	-301.39	446	1.5 U	0.250 UW	15,000	0.698	6.0
MW-510	10/28/09						Not sampled due to the presence of LNAPL					
MW-510	10/25/10						Not sampled due to the presence of LNAPL					
MW-510	12/13/11						Not sampled due to the presence of LNAPL					
MW-510	12/19/12	49.07	6.33	409.20	0.68	-57.34	260	22.5	0.250 U	300	2.2	5.0
MW-510	12/18/13	55.02	6.17	464.10	0.01	-118.25	225	1.50 U	0.250 U	4,300	0.563	5.2
MW-510	12/10/14	51.81	6.98	245.35	8.38	174.53	92.4	8	0.25 U	3 U	0.0036	0.0
MW-510 <sup>DB2</sup>	07/26/17	60.13	6.33	496.18	0.08	-36.0	NA	1.5 U	0.250 U	6,100	0.936	8.0
MW-511	10/24/08	55.73	6.59	248.56	0.41	25.86	122	23.1	0.35	1.63	0.289	0.2
MW-511	12/12/08	51.90	6.44	235.10	1.84	122.09	110	25.2	0.94	1.2 U	0.446	0.2
MW-511	02/25/09	48.43	6.12	350.22	3.73	140.09	77.9	23.3	1.1	5 U	0.169	0.0
MW-511	04/21/09	49.64	6.23	240.99	4.34	143.96	77.3	30.4	0.93	5 U	0.0887	0.0
MW-511	06/24/09	54.46	6.27	213.52	2.87	178.32	87.1	27.2	0.94	6.4	0.0855	NA
MW-511	08/19/09	58.96	6.30	211.69	3.17	145.06	86.1	22.3	0.94	5.4	0.0573	0.5
MW-511	10/28/09	54.96	6.20	211.44	3.68	91.82	94.4	23.2	1.4	5 U	0.0439	0.0

Table 3-5  
 Summary of Groundwater Analytical Data  
 Natural Attenuation Parameters  
 Former Unocal Edmonds Bulk Fuel Terminal  
 11720 Unoco Road  
 Edmonds, Washington

Monitoring Well	Date Sampled	Temperature (°F) <sup>1</sup>	pH <sup>1</sup>	Conductivity (µS/cm) <sup>1</sup>	DO (mg/L) <sup>1</sup>	ORP (mV) <sup>1</sup>	Total Alkalinity (mg/L as CaCO <sub>3</sub> ) <sup>2</sup>	Sulfate (mg/L) <sup>3</sup>	Nitrate (mg/L) <sup>3</sup>	Methane (µg/L) <sup>4</sup>	Manganese (mg/L) <sup>5</sup>	Ferrous Iron by Field Measurement (mg/L) <sup>6</sup>
MW-511	10/28/10	55.71	6.26	263.83	3.75	26.79	88.4	24.2	830	5 U	0.0046	0.1
MW-511	12/19/11	50.80	6.30	255.22	5.16	196.26	95.2	31.9	0.72	10 U	0.0015	0.0
MW-511	12/14/12	50.49	-18.06 <sup>^</sup>	399.71	4.93	1408.24	112	28.5	0.250 U	3.00 U	0.0026	0.5
MW-511	12/19/13	51.27	6.67	319.02	3.01	23.45	114	28.4	0.25 U	3 U	0.00073 U	NA
MW-511	12/10/14	53.78	6.47	376.51	2.53	160.12	122	30	0.25 U	3.2	0.0016	0.0
MW-511	07/27/17	55.41	6.20	300.62	1.78	148.0	NA	19.2	1.000	3.0 U	0.008	0.0
MW-511	03/21/18	49.82	6.47	225.31	3.63	190.8	NA	NA	NA	NA	NA	NA
MW-511	06/27/18	54.33	6.47	272.15	0.77	84.2	NA	22.6	0.250 U	3 U	0.056 U	0.0
MW-511	11/29/18	58.70	8.17	1.72	10.43	90.3	NA	18.2	0.34	3.0 U	0.005 U	NA
MW-512	10/23/08	60.03	6.54	396.67	-0.04	14.55	150	30.8	0.200 U	1,200 D	1.56	1.2
MW-512	12/11/08	53.48	6.58	480.74	0.01	-48.08	199	31.4	0.200 U	765	2.3	2.0
MW-512	02/25/09	47.91	6.59	441.66	0.64	-3.83	205	34.3	0.250 U	1,200	1.15	2.6
MW-512	04/21/09	51.96	7.05	460.06	0.37	-144.28	179	52.3	0.28	2,100	0.775	2.0
MW-512	06/24/09	61.82	6.65	368.86	0.38	-40.13	152	37	0.250 U	720	0.367	2.0
MW-512	08/19/09	66.20	6.55	346.88	0.23	-23.55	127	33.6	0.250 U	1,200	0.324	2.0
MW-512	10/27/09	59.92	6.66	369.90	2.04	-47.20	157	37.5	0.450	1,600	0.351	1.0
MW-512	10/28/10	59.67	6.72	444.53	0.88	-131.58	164	23.4	0.250 U	930	0.414	2.0
MW-512	12/15/11	51.70	6.90	306.64	0.02	-92.48	174	23.7	0.250 U	1,400	0.556	3.2
MW-512	12/17/12	52.54	6.87	508.74	0.59	-98.08	191	22.6	0.250 U	1,900	0.485	5.0
MW-512	12/18/13	52.11	6.78	291.10	0.13	-66.95	178	17.6	0.250 U	1,000	0.662	2.6
MW-512	12/11/14	53.99	6.89	568.20	6.52	-199.75	181	15	0.25 U	1700	0.635	0.1
MW-512	07/26/17	61.67	6.99	558.10	0.15	-95.0	NA	9.3	0.250 U	1,300	0.433	5.0
MW-512	03/21/18	49.30	7.09	305.81	0.42	15.80	NA	NA	NA	NA	NA	NA
MW-512 (Duplicate)	03/21/18	--	--	--	--	--	NA	NA	NA	NA	NA	NA
MW-512	06/28/18	62.12	6.80	376.27	1.71	64.6	NA	21.3	0.280	68	0.039	0.0
MW-512 (Duplicate)	06/28/18	--	--	--	--	--	--	22.5	0.250 U	42	0.043	--
MW-512	11/29/18	56.20	6.78	602.89	1.46	-25.2	NA	38.7	0.32	93	0.511	1.0
MW-513	10/23/08	58.08	6.78	405.45	-0.06	-63.03	182	19.3	0.200 U	523	2.09	2.0
MW-513	12/10/08	55.20	6.73	491.21	-0.06	-103.79	197	23.9	0.200 U	465	2.18	2.8
MW-513	02/25/09	49.12	6.76	342.53	0.10	-45.95	210	14.8	0.250 U	490	1.9	2.4
MW-513	04/22/09	50.10	6.81	342.40	0.12	-225.74	182	26.6	0.250 U	650	1.89	3.5
MW-513	06/24/09	59.64	6.82	321.78	0.09	-89.07	167	13.1	0.28	300	1.38	3.0
MW-513	08/20/09	62.58	6.73	343.96	0.11	-81.20	168	15.5	0.250 UW	320 P	1.38	2.8
MW-513	10/27/09	59.76	6.73	374.84	0.08	-96.67	178	24.3	0.250 U	550	1.8	4.0
MW-513	10/28/10	58.03	6.63	395.68	0.10	-103.39	164	11.2	0.250 U	690	1.36	3.8
MW-513	12/15/11	52.17	6.69	289.77	0.05	-60	156	16.7	0.250 U	370	1.28	3.1
MW-513	12/17/12	52.34	6.69	280.90	0.29	-82.64	159	10.4	0.250 U	920	1.17	4.1
MW-513	12/18/13	54.18	6.69	188.41	-0.01	-77.71	182	8.9	0.250 U	840	1.29	3.9
MW-513	12/10/14	55.63	6.75	471.76	-0.01	-59.79	171	13	0.25 U	790	1.07	5.0
MW-513	07/25/17	62.95	6.47	469.48	0.11	7.6	NA	11.8	0.250 U	460	1.050	4.5
MW-513	03/21/18	52.20	6.78	2,189.70	1.11	-61.7	NA	NA	NA	NA	NA	NA
MW-513	06/28/18	59.39	6.72	1,558.40	0.10	-81.9	NA	34.3	0.250 U	610	1.330	5.5
MW-513	11/29/18	55.74	6.81	2,540.8	0.41	-75.2	NA	38.9	0.50	450	1.870	5.5

Table 3-5  
 Summary of Groundwater Analytical Data  
 Natural Attenuation Parameters  
 Former Unocal Edmonds Bulk Fuel Terminal  
 11720 Unoco Road  
 Edmonds, Washington

Monitoring Well	Date Sampled	Temperature (°F) <sup>1</sup>	pH <sup>1</sup>	Conductivity (µS/cm) <sup>1</sup>	DO (mg/L) <sup>1</sup>	ORP (mV) <sup>1</sup>	Total Alkalinity (mg/L as CaCO <sub>3</sub> ) <sup>2</sup>	Sulfate (mg/L) <sup>3</sup>	Nitrate (mg/L) <sup>3</sup>	Methane (µg/L) <sup>4</sup>	Manganese (mg/L) <sup>5</sup>	Ferrous Iron by Field Measurement (mg/L) <sup>6</sup>
MW-514	10/23/08	59.15	6.81	368.79	-0.05	-69.84	182	17.4	0.23	200	1.62	2.2
MW-514	12/10/08	55.53	6.74	410.41	0.01	-105.01	191	29.2	0.200 U	428	2.89	2.8
MW-514	02/24/09	50.68	6.74	330.80	0.15	-84.41	189	21.5	0.250 U	680	2.07	2.2
MW-514	04/21/09	51.33	6.83	345.19	0.43	-150.08	176	28.5	0.250 U	710	1.93	4.0
MW-514	06/24/09	60.09	6.89	340.42	0.21	-133.74	167	17.8	0.31	400	1.54	3.0
MW-514	08/19/09	64.22	6.77	362.34	0.10	-88.48	153	12.7	0.250 U	580	1.47	4.0
MW-514	10/27/09	60.17	6.72	342.77	0.18	-90.96	169	13.8	0.250 U	690	1.67	4.0
MW-514	10/27/10	58.93	6.62	403.73	0.07	-128.19	160	19.2	0.250 U	210	1.94	4.2
MW-514	12/14/11	51.76	6.53	389.84	0.10	-0.09	152	19.3	0.250 U	340	1.69	3.0
MW-514	12/17/12	53.14	6.55	396.25	0.39	-101.68	162	20.4	0.250 U	390	1.510	4.0
MW-514	12/18/13	53.06	6.58	175.41	0.01	-56.60	155	16.9	0.250 U	420	1.68	2.4
MW-514	12/11/14	54.02	6.62	454.38	0.27	-226.67	151	17.1	0.25	360	1.47	2.0
MW-514	07/27/17	64.48	6.73	352.17	0.29	15.5	NA	11.1	0.250 U	620	0.330	0.5
MW-514	03/21/18	52.29	6.67	1,410.00	0.60	35.9	NA	NA	NA	NA	NA	NA
MW-514	06/28/18	60.62	6.72	505.07	3.92	143.5	NA	23.1	0.280	190	0.155	0.0
MW-514	11/29/18	56.43	6.54	751.89	0.18	47.3	NA	23.2	0.25 U	420	1.850	1.0
MW-515	10/22/08	62.15	6.60	451.90	0.00	23.35	174	36.2	0.200 U	395	2.46	1.1
MW-515	12/10/08	53.51	6.66	444.71	0.03	73.86	131	78.2	0.56	12.7	1.32	0.0
MW-515	02/24/09	49.14	6.63	382.79	1.00	76.95	125	61.6	0.250 U	99	0.541	0.0
MW-515	04/22/09	49.78	6.86	288.96	1.29	-156.87	112	54.1	0.250 U	45	0.569	0.0
MW-515	06/24/09	62.81	6.64	514.96	0.11	29.36	185	55.6	0.250 U	510	1.43	0.5
MW-515	08/20/09	67.66	6.65	526.87	0.29	14.84	194	33	0.250 UW	410	1.56	0.2
MW-515	10/27/09	60.81	6.76	319.95	1.41	40.71	137	33	0.250 U	270	0.97	0.5
MW-515	10/27/10	61.29	6.76	334.75	1.35	-91.25	150	30.2	0.250 U	240	0.645	1.0
MW-515	12/14/11	50.52	6.90	278.52	0.05	40	145	50	0.250 U	86	0.419	0.0
MW-515	12/17/12	52.38	6.85	202.11	5.71	111.67	87.6	18.2	0.250 U	9.0	0.119	<1
MW-515	12/18/13	51.48	6.80	279.20	0.21	-68.34	140	24.4	0.250 U	36	0.188	0.8
MW-515	12/11/14	53.51	6.87	379.34	1.32	110.50	126	23	0.25 U	3 U	0.0811	0.1
MW-515	07/25/17	65.67	6.73	390.53	0.15	13.4	NA	20.1	0.250 U	330	0.318	0.5
MW-515	03/21/18	48.52	10.18	0.40	11.32	119.9	NA	NA	NA	NA	NA	NA
MW-515	06/28/18	62.54	6.81	862.0	0.11	46.9	NA	30.2	0.250 U	81	0.093	0
MW-515	11/28/18	55.71	6.96	789.58	2.39	92.1	NA	37.9	0.60	4.3	0.087	0.0
MW-515 (Duplicate)	11/28/18	NA	NA	NA	NA	NA	NA	40.0	0.66	6.3	0.081	NA
MW-516	10/22/08	60.37	6.75	410.68	0.21	22.93	175	43.2	0.200 U	439	2.23	0.4
MW-516	12/10/08	53.18	6.64	391.95	0.03	54.04	149	57.6	0.33	22	1.58	0.0
MW-516	02/24/09	45.41	6.85	296.90	2.83	109.91	111	55.6	0.75	5.7	0.26	0.0
MW-516	04/22/09	49.82	6.86	290.47	3.59	-7.72	110	54.1	0.5	10 U	0.0591	1.0
MW-516	06/24/09	65.26	6.67	525.02	0.61	24.67	182	48.8	0.250 U	450	0.592	0.0
MW-516	08/20/09	68.95	6.68	474.28	0.83	42.34	184	25.7	0.250 UW	300 P	1.02	0.0
MW-516	10/27/09	60.04	6.69	339.91	1.48	38.92	149	34.4	0.250 U	25	0.831	0.0
MW-516	10/27/10	60.44	6.59	373.46	1.74	-27.12	142	31.4	0.250 U	26	0.386	0.1
MW-516	12/14/11	50.40	6.67	399.03	2.39	110	0.46 U	21.4	0.250 U	150	0.402	0.0
MW-516	12/17/12	49.35	7.26	127.11	10.16	91.17	62.6	3.6	0.250 U	3 U	0.0328	0.0

**Table 3-5**  
**Summary of Groundwater Analytical Data**  
**Natural Attenuation Parameters**  
**Former Unocal Edmonds Bulk Fuel Terminal**  
**11720 Unoco Road**  
**Edmonds, Washington**

Monitoring Well	Date Sampled	Temperature (°F) <sup>1</sup>	pH <sup>1</sup>	Conductivity (µS/cm) <sup>1</sup>	DO (mg/L) <sup>1</sup>	ORP (mV) <sup>1</sup>	Total Alkalinity (mg/L as CaCO <sub>3</sub> ) <sup>2</sup>	Sulfate (mg/L) <sup>3</sup>	Nitrate (mg/L) <sup>3</sup>	Methane (µg/L) <sup>4</sup>	Manganese (mg/L) <sup>5</sup>	Ferrous Iron by Field Measurement (mg/L) <sup>6</sup>
MW-516	12/18/13	51.00	6.75	249.92	0.45	-13.89	134	21.4	0.250 U	62	0.336	0.9
MW-516	12/11/14	53.36	6.85	279.66	3.54	94.10	111	13	0.25 U	7.1	.228	0.0
MW-516	07/25/17	66.21	6.72	330.69	0.90	51.9	NA	23.3	0.250 U	150	0.095	0.0
MW-516 (Duplicate)	07/25/17	--	--	--	--	--	--	21.4	0.250 U	130	0.089	--
MW-516	03/21/18	48.64	10.03	0.40	11.33	120.7	NA	NA	NA	NA	NA	NA
MW-516	06/28/18	64.49	6.70	719.44	0.56	98.5	NA	32.6	0.250 U	27	0.222	0.0
MW-516	11/29/18	55.69	6.90	417.93	3.31	140.1	NA	21.3	1.90	3.0 U	0.066	0.0
MW-517	10/22/08	59.72	6.52	361.40	0.10	15.95	156	39.3	0.200 U	1,080 D	3.17	0.6
MW-517	12/10/08	52.71	6.51	374.55	-0.04	63.88	161	47.4	0.200 U	394	1.81	0.0
MW-517	02/24/09	46.38	6.71	355.26	1.97	101.76	127	65.8	1.2	11	0.892	0.4
MW-517	04/22/09	50.90	6.70	348.44	1.21	-81.24	128	66.7	0.250 U	43	0.584	1.0
MW-517	06/24/09	64.49	6.72	463.93	0.61	-52.18	184	50.5	0.250 U	1,700	1.14	1.0
MW-517	08/20/09	67.06	6.60	437.32	0.33	7.39	184	20.6	0.250 UW	4,400	1.36	0.5
MW-517	10/27/09	60.36	6.66	355.06	0.41	15.34	148	41.9	0.250 U	99	1.09	1.5
MW-517	10/27/10	59.99	6.68	381.89	0.56	-12.51	145	35.3	0.250 U	270	0.641	0.5
MW-517	12/14/11	50.41	6.76	292.70	0.07	43.46	165	26	0.250 U	75	0.788	0.6
MW-517	12/17/12	50.94	7.19	184.80	9.90	73.30	101	8.6	0.250 U	12	0.0913	0.0
MW-517	12/18/13	50.64	6.71	273.51	0.24	-13.52	150	21.8	0.250 U	18	0.474	0.4
MW-517	12/11/14	52.76	6.89	308.53	5.90	77.27	124	15	0.25 U	4.4	0.687	0.1
MW-517	07/25/17	65.75	6.56	232.95	0.36	29.2	NA	11.8	0.250 U	520	0.338	0.5
MW-517	03/21/18	47.83	10.79	0.39	11.43	113.0	NA	NA	NA	NA	NA	NA
MW-517	06/28/18	63.39	6.82	493.84	1.71	89.0	NA	25.7	0.310	3 U	0.148	0.0
MW-517	11/29/18	54.54	6.93	415.38	4.11	117.8	NA	21.6	0.39	13	0.062	0.0
MW-518	10/22/08	61.89	6.46	2,403.10	0.10	6.25	194	93.4	0.200 U	2,380 D	1.6	3.0
MW-518	12/10/08	56.07	6.64	590.16	0.08	22.59	247	32.5	0.200 U	1,920 D	2.22	1.6
MW-518	02/25/09	47.59	6.55	482.43	0.15	-9.02	209	61.1	0.250 U	2,900	1.99	2.2
MW-518	04/22/09	48.17	6.52	519.99	0.27	-182.35	163	63.6	0.6	3,100	1.48	2.0
MW-518	06/25/09	58.02	6.48	1,501.29	0.24	6.00	117	97.6	0.5	1,500	1.67	2.0
MW-518	08/20/09	65.80	6.49	2,674.51	0.12	-247.61	176	119	0.250 UW	4,500	1.5	3.0
MW-518	10/30/09	62.35	6.50	1,278.14	0.45	-46.31	224	51.6	0.250 U	4,000	1.57	4.0
MW-518	10/28/10	60.96	6.57	1,587.58	0.04	-116.69	200	70.4	0.250 U	3,500	1.38	8.0
MW-518	12/14/11	54.16	6.57	645.67	0.56	0.00	213	85.6	0.530	1,500	0.807	4.0
MW-518	12/17/12	54.97	6.60	676.38	1.03	-39.40	223	132	0.480	1400	0.484	0.7
MW-518	12/19/13	53.90	6.78	319.92	0.25	-40.51	198	7.4	0.250 U	3,700	0.64	1.8
MW-518	12/11/14	57.43	6.69	671.16	1.01	56.96	214	62	0.34	1900	0.35	0.1
MW-518	07/25/17	62.68	6.91	388.33	--	22.2	NA	32.5	0.250 U	500	0.181	0.25
MW-518	03/21/18	50.50	9.96	0.4	10.96	113.3	NA	NA	NA	NA	NA	NA
MW-518	06/28/18	57.74	7.11	419.86	0.35	-144.8	NA	18.9	0.250 U	4,200	0.215	0.5
MW-518 (Duplicate)	06/28/18	--	--	--	--	--	--	23.6	0.250 U	4,000	0.213	--
MW-518	11/28/18	58.46	6.81	1,055.6	0.14	-87.4	NA	7.5	0.25 U	2,300	0.867	4.0
MW-519	10/22/08	58.05	6.55	535.69	-0.02	-34.53	217	29.8	0.200 U	6,780 D	1.31	3.6
MW-519	12/09/08	53.23	6.64	610.07	0.11	-70.36	250	30	0.200 U	9,760 D	1.34	3.2
MW-519	02/24/09	46.76	6.65	405.26	0.10	-41.65	186	43.1	0.46	8,800	0.847	2.7



Table 3-5  
 Summary of Groundwater Analytical Data  
 Natural Attenuation Parameters  
 Former Unocal Edmonds Bulk Fuel Terminal  
 11720 Unoco Road  
 Edmonds, Washington

Monitoring Well	Date Sampled	Temperature (°F) <sup>1</sup>	pH <sup>1</sup>	Conductivity (µS/cm) <sup>1</sup>	DO (mg/L) <sup>1</sup>	ORP (mV) <sup>1</sup>	Total Alkalinity (mg/L as CaCO <sub>3</sub> ) <sup>2</sup>	Sulfate (mg/L) <sup>3</sup>	Nitrate (mg/L) <sup>3</sup>	Methane (µg/L) <sup>4</sup>	Manganese (mg/L) <sup>5</sup>	Ferrous Iron by Field Measurement (mg/L) <sup>6</sup>
MW-519	04/21/09	51.87	6.63	478.38	0.13	638.95	255	21.5	0.250 U	14,000	1.22	2.7
MW-519	06/24/09	60.02	6.58	618.06	0.06	-67.35	290	9.7	0.25 U	13,000	1.15	5.0
MW-519	08/18/09	66.09	6.61	691.65	0.14	-57.02	258	36.7	0.250 U	14,000	1.16	2.5
MW-519	10/27/09	59.84	6.59	364.97	0.31	-72.83	124	49.6	0.250 U	6,400	0.61	2.0
MW-519	10/26/10	59.52	6.53	469.46	0.18	-61.26	170	71.6	0.250 U	3,900	0.473	4.2
MW-519	12/14/11	51.03	6.69	402.43	-0.01	-40	266	38.8	0.370	11,000	0.822	0.0
MW-519	12/17/12	50.40	6.73	300.97	2.09	47.42	145	54.6	0.310	1300	0.186	0.0
MW-519	12/17/13	50.70	6.66	464.83	-0.01	-50.27	253	17.9	0.250 U	12,000	0.814	3.0
MW-519	12/10/14	51.80	7.00	344.69	5.02	56.84	109	34	0.25 U	170	0.0374	0.1
MW-519	07/25/17	67.16	6.56	647.57	0.25	-36.3	NA	7.0	0.250 U	13,000	0.545	3.5
MW-519	03/22/18	47.66	7.19	370.84	3.57	102.3	NA	NA	NA	NA	NA	NA
MW-519 (Duplicate)	03/22/18	--	--	--	--	--	NA	NA	NA	NA	NA	NA
MW-519	06/27/18	64.38	6.65	479.94	0.98	9.6	NA	39.2	0.250 U	72	0.586	1.0
MW-519	11/29/18	54.33	7.51	483.32	8.01	97.4	NA	70.1	0.35	3.0 U	0.009	0.0
MW-520	10/21/08	59.76	6.79	944.21	0.02	-14.62	212	32	0.200 U	2,230 D	1.58	1.4
MW-520	12/09/08	53.17	6.81	584.24	0.12	-89.46	189	28.7	0.200 U	2,240 D	1.48	1.4
MW-520	02/23/09	47.79	6.84	477.54	0.16	-57.60	187	22.1	0.250 U	2,500	1.18	1.6
MW-520	04/22/09	48.74	6.75	397.91	0.40	-161.40	162	33.6	0.250 U	2,200	746	2.0
MW-520	06/24/09	60.08	6.67	584.31	0.04	-54.65	202	19.3	0.250 U	4,900	1.46	3.0
MW-520	08/18/09	67.93	6.60	587.53	0.06	27.15	194	5.5	0.250 U	1,600	1.09	2.0
MW-520	10/27/09	60.06	6.50	483.54	0.09	9.18	153	33.6	0.250 U	1,100	1.03	1.0
MW-520	10/27/10	60.39	6.48	731.32	0.20	-82.10	201	16	0.250 U	1,600	1.46	1.8
MW-520	12/14/11	51.35	6.58	612.41	0.16	40	161	51	0.250 U	740	1.08	1.0
MW-520	12/14/12	52.50	6.75	303.23	0.07	-80.88	137	38.4	0.250 U	130	0.833	1.0
MW-520	12/17/13	52.02	6.69	489.30	0.14	-189.75	176	68.3	0.250 U	750	0.676	1.0
MW-520	12/10/14	54.54	7.11	472.05	3.86	125.06	95.6	84	0.25 U	53	0.0639	0.0
MW-520	07/25/17	65.71	6.74	786.68	0.15	183.5	NA	21.7	0.250 U	820	3.550	0.0
MW-520	03/20/18	48.45	7.18	783.61	4.30	106.2	NA	NA	NA	NA	NA	NA
MW-520	06/28/18	60.89	6.87	573.88	0.13	14.8	NA	38.3	0.250 U	120	1.110	0.0
MW-520	11/29/18	55.00	6.97	1,224.6	6.42	91.7	NA	268	0.75	7.9	0.005 U	0.0
MW-521	10/21/08	59.50	6.57	818.08	-0.01	4.73	172	63.9	0.200 U	888	1.42	0.9
MW-521	12/09/08	53.28	6.77	555.86	0.38	-70.66	174	37.3	0.200 U	1,310	1.48	0.5
MW-521	02/23/09	46.76	6.78	408.37	0.11	-33.28	150	50.8	0.250 U	1,200	1.44	0.6
MW-521	04/21/09	52.18	6.65	282.87	0.33	643.50	105	43.5	0.250 U	66	0.587	0.2
MW-521	06/23/09	62.33	6.68	366.61	0.35	12.69	142	33.4	0.250 U	530	0.649	1.0
MW-521	08/19/09	66.65	6.54	504.12	0.14	-9.28	172	46.1	0.250 U	740	0.899	1.5
MW-521	10/26/09	60.51	6.71	701.29	0.15	-191.41	154	52.3	0.250 U	3,100	1.73	1.5
MW-521	10/27/10	59.20	6.50	541.24	0.18	-90.60	177	38.2	0.250 U	1,200	1.25	1.6
MW-521	12/14/11	45.43	7.11	220.14	11.97	90	145	143	0.250 U	200	1.04	1.4
MW-521	12/17/12	49.57	6.66	171.31	6.93	158.90	60.6	51.2	0.250 U	3.0 U	0.0157	0.5
MW-521	12/17/13	51.60	6.66	388.24	0.67	40.58	150	64.4	0.250 U	150	0.305	0.5
MW-521	12/10/14	51.76	7.20	227.11	6.97	-69.70	48.7	33	0.25 U	3 U	0.0065	0.1
MW-521	07/25/17	67.15	6.19	632.67	0.70	18.4	NA	21.6	0.250 U	310	0.620	1.25
MW-521	03/20/18	49.39	6.99	320.66	1.30	189.0	NA	NA	NA	NA	NA	NA
MW-521	06/28/18	62.98	6.70	574.72	0.74	123.8	NA	52.2	0.250 U	75	1.030	0.0
MW-521	11/30/18	52.16	7.02	314.57	6.34	94.9	NA	49.9	0.25 U	3.0 U	0.005 U	0.5

Table 3-5  
 Summary of Groundwater Analytical Data  
 Natural Attenuation Parameters  
 Former Unocal Edmonds Bulk Fuel Terminal  
 11720 Unoco Road  
 Edmonds, Washington

Monitoring Well	Date Sampled	Temperature (°F) <sup>1</sup>	pH <sup>1</sup>	Conductivity (µS/cm) <sup>1</sup>	DO (mg/L) <sup>1</sup>	ORP (mV) <sup>1</sup>	Total Alkalinity (mg/L as CaCO <sub>3</sub> ) <sup>2</sup>	Sulfate (mg/L) <sup>3</sup>	Nitrate (mg/L) <sup>3</sup>	Methane (µg/L) <sup>4</sup>	Manganese (mg/L) <sup>5</sup>	Ferrous Iron by Field Measurement (mg/L) <sup>6</sup>
MW-522	10/21/08	62.31	6.57	756.65	0.06	-47.72	251	18	0.200 U	972	1.7	5.2
MW-522	12/09/08	53.30	6.71	548.80	0.14	-98.92	200	73.9	0.200 U	297	1.07	5.2
MW-522	02/23/09	48.06	6.56	503.15	0.12	-50.16	171	108	0.250 U	260	1.16	4.6
MW-522	04/21/09	49.60	6.65	393.02	0.11	699.67	154	76.6	0.250 U	74	0.88	5.2
MW-522	06/23/09	59.64	6.61	442.11	0.05	-75.88	186	51	0.250 U	140	0.963	3.0
MW-522	08/18/09	68.79	6.61	621.20	0.07	-68.46	244	29.5	0.250 U	580	1.26	3.0
MW-522	10/26/09	61.92	6.43	1,166.69	0.09	-25.26	206	560	0.280	400	0.947	3.0
MW-522	10/26/10	59.92	6.30	4,979,442.00	0.43	-104.90	208	628	0.250 U	180	0.758	0.8
MW-522	12/14/12	53.35	6.54	552.82	0.04	-16.41	203	106	0.250 U	230	1.04	1.5
MW-522	12/14/12	50.74	7.06	545.49	6.53	138.56	163	264	0.250 U	3.0 U	0.0019	0.0
MW-522	12/17/13	54.67	6.54	591.41	0.09	-207.15	221	68.7	0.250 U	560	0.991	0.0
MW-522	12/10/14	52.72	7.08	802.18	5.09	183.44	157	196	0.25 U	3 U	0.00055 U	0.0
MW-522	07/25/17	58.45	6.45	451.80	--	102.4	NA	14.0	0.250 U	1,000	1.780	0.0
MW-522	03/20/18	49.86	7.15	567.69	0.72	221.0	NA	NA	NA	NA	NA	NA
MW-522	06/28/18	56.45	6.62	529.64	0.11	55.1	NA	71.6	0.250 U	160	0.786	0.0
MW-522	11/29/18	53.17	7.32	845.16	8.44	164.7	NA	236	0.34	3.0 U	0.005 U	0.0
MW-523	10/21/08	61.66	6.66	870.33	0.01	24.73	221	45.7	0.200 U	1,940 D	3.28	0.8
MW-523	12/09/08	54.24	6.71	587.13	0.31	31.67	218	53.2	0.200 U	482	3.01	0.6
MW-523	02/23/09	47.46	6.67	420.64	0.41	98.18	164	70	0.250 U	31	1.12	0.0
MW-523	04/21/09	49.53	6.76	353.07	0.35	-56.71	146	56.8	0.250 U	280	1.39	0.0
MW-523	06/23/09	62.92	6.77	437.56	2.42	141.87	164	42.4	0.250 U	5 U	0.593	0.0
MW-523	08/18/09	68.16	6.64	614.62	0.16	53.81	199	21	0.250 U	1,600	1.38	0.0
MW-523	10/26/09	62.44	6.65	720.56	0.28	62.64	248	46.5	0.250 U	420	2.95	1.0
MW-523	10/26/10	60.60	6.57	815.65	0.58	31.43	220	102	0.250 U	400	1.15	1.0
MW-523	12/13/11	53.06	6.64	599.47	0.29	70	224	44.2	0.400	72	1.31	0.8
MW-523	12/14/12	53.57	6.71	372.50	6.84	217.62	146	87.2	0.250 U	5.4	0.0707	NA
MW-523	12/17/13	52.41	6.59	385.69	0.31	-195.99	183	49.9	0.250 U	25	0.47	0.0
MW-523	12/10/14	54.18	6.58	620.59	2.77	-20.73	192	63	0.390	3 U	0.008	0.0
MW-524	10/21/08	60.03	6.46	965.29	-0.04	16.91	115	402	0.34	51	0.623	1.6
MW-524	12/09/08	52.74	6.58	421.64	2.81	154.94	70.6	172	0.62	2.1	0.0353	0.0
MW-524	02/23/09	47.66	6.62	337.04	2.35	118.32	76.5	141	0.48	6.2	0.0159	0.2
MW-524	04/21/09	48.81	6.60	309.12	4.93	68.52	73.2	119	0.250 U	12	0.0308	0.0
MW-524	06/23/09	59.55	6.59	374.54	0.55	139.04	86	121	0.250 U	5 U	0.0235	0.0
MW-524	08/18/09	65.03	6.49	468.64	0.50	108.31	104	154	0.250 U	7.9	0.0537	0.0
MW-524	10/26/09	59.41	6.27	685.50	0.66	259.84	38	410	0.450	5 U	0.0106	1.0
MW-524	10/26/10	59.22	6.45	1,908,568.00	4.24	131.09	52.6	225	0.260	5 U	0.84	0.4
MW-524	12/13/11	48.68	6.60	287.04	4.27	200	44.4	200	0.550 U	5 U	0.0048	0.0
MW-524	12/14/12	49.55	6.54	159.72	8.71	245.64	59.3	50.5	0.250 U	3.0 U	0.00048	1.0
MW-524	12/17/13	52.89	6.66	327.49	1.68	228.79	69.9	137	0.250 U	3.0 U	0.0031	0.0
MW-524	12/09/14	54.12	6.63	263.18	4.54	233.36	60.0	63	0.250 U	3 U	0.001 U	0.0
MW-525	12/14/12	55.41	6.42	485.07	0.10	-160.05	243	4.9	0.250 U	5,100	2.25	6.0
MW-525	12/17/13	53.85	6.37	274.47	0.01	-106.94	165	4.5	0.250 U	1,800	0.96	1.0
MW-525	12/09/14	56.56	6.41	550.92	0.09	-131.07	240	4	0.25 U	8900	2.86	>10
MW-525	07/26/17	60.26	6.53	353.07	0.11	-66.6	NA	5.9	0.250 U	6,700	0.705	6.5
MW-525	03/20/18	50.36	--	--	10.55	61.0	NA	NA	NA	NA	NA	NA
MW-525	06/27/18	63.42	5.43	1,013.20	0.02	-266.6	NA	453.0	0.250 U	1,900	4.210	5.0

Table 3-5  
 Summary of Groundwater Analytical Data  
 Natural Attenuation Parameters  
 Former Unocal Edmonds Bulk Fuel Terminal  
 11720 Unoco Road  
 Edmonds, Washington

Monitoring Well	Date Sampled	Temperature (°F) <sup>1</sup>	pH <sup>1</sup>	Conductivity (µS/cm) <sup>1</sup>	DO (mg/L) <sup>1</sup>	ORP (mV) <sup>1</sup>	Total Alkalinity (mg/L as CaCO <sub>3</sub> ) <sup>2</sup>	Sulfate (mg/L) <sup>3</sup>	Nitrate (mg/L) <sup>3</sup>	Methane (µg/L) <sup>4</sup>	Manganese (mg/L) <sup>5</sup>	Ferrous Iron by Field Measurement (mg/L) <sup>6</sup>
MW-525	11/27/18	56.94	6.35	152.34	1.50	-82.0	NA	24.2	0.54	45	0.093	5.0
MW-526	12/14/12	53.11	6.38	765.25	0.02	-58.05	340	27.5	0.250 U	950	1.36	3.0
MW-526	12/18/13	51.73	6.44	716.30	0.02	-91.82	332	1.5 U	0.250 U	1,500	1.34	1.0
MW-526	12/10/14	54.56	6.64	783.77	0.19	-278.66	293	3	0.25 U	1500	1.53	>10
MW-526	07/26/17	64.69	6.50	383.76	0.04	-19.3	NA	1.5 U	0.250 U	2,100	1.060	6.75
MW-526	03/20/18	49.73	--	--	10.50	-102.7	NA	NA	NA	NA	NA	NA
MW-526	06/27/18	60.72	6.78	567.73	0.29	-97.9	NA	69.0	0.250 U	110	0.557	5.0
MW-526	11/27/18	54.44	6.44	308.85	8.27	108.5	NA	68.5	4.00	3.0 U	0.414	7.0
MW-527	12/19/12	48.18	6.60	356.45	3.32	-29.37	206	12.6	0.250 U	24	0.56	0.3
MW-527	12/20/13	48.37	6.45	994.66	0.16	107.81	849	9.8	0.250 U	20,000	15.30	5.0
MW-527	12/12/14	51.72	6.61	401.96	1.25	23.20	251	14	0.250 U	2300	2.280	3.0
MW-528	12/19/12	50.69	6.55	628.52	0.72	-13.19	433	32.4	0.250 U	5,400	9.27	4.0
MW-528	12/20/13	50.42	6.56	1034.89	0.03	-35.07	517	22.7	0.250 U	11,000	18.50	6.8
MW-528	12/12/14	53.69	6.67	785.71	0.07	-54.36	398	22	0.250 U	7000	11.400	6.0
MW-529	12/17/12	49.88	6.83	13407.29	0.02	-201.83	262	803.0	0.250 U	1,200	0.49	0.0
MW-529	12/18/13	47.68	6.72	23665.38	-0.01	-203.12	171	1000.0	0.250 U	750	0.52	0.8
MW-529	12/09/14	53.13	6.87	15,913.73	0.01	-272.61	285	769	0.25 U	1100	0.306	0.1
MW-529 <sup>DB2</sup>	07/27/17	63.65	6.73	30,169	--	--	NA	1,410	0.250 U	59	0.584	3.5
MW-530	12/17/12	47.82	6.66	26642.38	0.14	-189.47	140	1290.0	0.250 U	16	0.20	0.3
MW-530	12/18/13	47.60	6.83	17872.35	0.07	-230.02	141	1080.0	0.250 U	130	0.21	0.5
MW-530	12/09/14	51.28	7.05	23,463.17	-0.02	-215.89	131	935	0.25 U	20	0.187	0.1
MW-530	07/26/17	61.35	6.41	27,495	0.21	-142.2	NA	1,480	0.250 U	44	0.194	0.0
MW-530	03/20/18	48.64	6.73	20,529.00	0.14	-252.0	NA	NA	NA	NA	NA	NA
MW-530	06/27/18	58.82	6.87	16,447.00	0.05	-278.2	NA	769.0	0.250 U	61	0.087	0.0
MW-530	11/27/18	52.27	6.59	24,312	0.10	-280.4	NA	935	0.25 U	10	0.091	0.5
MW-531	12/18/12	47.22	6.72	408.24	0.98	-4.57	176	130.0	0.510	120	0.08	0.7
MW-531	12/17/13	52.70	6.46	313.43	0.05	-58.89	172	6.1	0.250 U	1,100	0.60	0.3
MW-531	12/09/14	51.09	6.49	292.36	0.06	-8.26	107	33	0.25 U	1200	0.115	0.6
MW-531	07/26/17	61.39	6.56	254.24	--	-3.0	NA	1.5 U	0.250 U	3,300	0.532	3.25
MW-531	03/20/18	48.13	7.04	371.15	0.55	109.2	NA	NA	NA	NA	NA	NA
MW-531	06/27/18	60.25	6.63	490.45	1.54	28.8	NA	47.5	0.520	86	0.312	0.0
MW-531	11/27/18	51.75	6.86	775.20	3.86	159.5	NA	224	0.67	3.0 U	0.005 U	0.0
MW-532	12/14/12	53.44	6.35	259.66	0.04	-92.42	113	39.3	0.250 U	220	0.24	1.0
MW-532	12/17/13	53.07	6.20	252.35	0.02	-60.71	105	36.1	0.250 U	210	0.13	0.2
MW-532	12/09/14	54.89	6.34	242.53	0.12	-99.77	112	27	0.25 U	730	0.329	2.5
MW-532	07/26/17	60.82	6.29	373.47	0.07	-62.9	NA	1.5 U	0.250 U	2,500	0.825	7.0
MW-532	03/20/18	48.70	--	288.13	0.27	--	NA	NA	NA	NA	NA	NA
MW-532	06/27/18	58.24	5.74	450.76	0.07	-44.0	NA	159.0	0.250 U	360	0.460	0.5
MW-532	11/27/18	55.89	6.60	264.49	8.15	127.5	NA	51.8	0.52	3.0 U	0.02	0.5
MW-533	03/20/18	47.90	6.83	11,287.00	3.19	155.7	NA	NA	NA	NA	NA	NA
MW-533	06/27/18	63.06	7.18	709.84	0.43	89.7	NA	30.5	0.250 U	6	0.035	0.0
MW-533	11/27/18	53.47	7.15	3,299.6	6.46	109.1	NA	182	0.52	3.0 U	0.007 U	0.0
MW-534	03/20/18	52.29	6.74	3,908.10	0.08	-20.0	NA	NA	NA	NA	NA	NA
MW-534	06/27/18	63.17	6.66	2,453.1	0.15	-184.2	NA	41.3	0.250 U	5,500	3.760	6
MW-534	11/28/18	53.85	6.47	183.11	3.62	109.1	NA	32.5	0.25 U	140	0.209	0.0
MW-534 (Duplicate)	11/28/18	NA	NA	NA	NA	NA	NA	35.4	0.25 U	200	0.226	NA

Table 3-5  
 Summary of Groundwater Analytical Data  
 Natural Attenuation Parameters  
 Former Unocal Edmonds Bulk Fuel Terminal  
 11720 Unoco Road  
 Edmonds, Washington

Monitoring Well	Date Sampled	Temperature (°F) <sup>1</sup>	pH <sup>1</sup>	Conductivity (µS/cm) <sup>1</sup>	DO (mg/L) <sup>1</sup>	ORP (mV) <sup>1</sup>	Total Alkalinity (mg/L as CaCO <sub>3</sub> ) <sup>2</sup>	Sulfate (mg/L) <sup>3</sup>	Nitrate (mg/L) <sup>3</sup>	Methane (µg/L) <sup>4</sup>	Manganese (mg/L) <sup>5</sup>	Ferrous Iron by Field Measurement (mg/L) <sup>6</sup>
MW-535	03/20/18	48.11	6.96	34199.00	5.34	299.10	NA	NA	NA	NA	NA	NA
MW-535 (Duplicate)	03/20/18	--	--	--	--	--	NA	NA	NA	NA	NA	NA
MW-535	06/27/18	68.39	7.27	640.02	0.22	28.8	NA	29.6	0.250 U	8	0.044	NA
MW-535 (Duplicate)	06/27/18	--	--	--	--	--	--	21.9	0.250 U	6	0.048	--
MW-535	11/27/18	53.12	6.95	8,102.40	7.06	9.0	NA	387	0.59	5.0	0.016	0.0
MW-8R	10/21/08	61.34	6.65	860.34	-0.02	-100.66	217	50.6	0.200 U	304	1.49	1.2
MW-8R	12/09/08	54.32	6.83	494.30	0.40	-132.57	180	58.1	0.200 U	299	0.664	1.2
MW-8R	02/23/09	47.03	6.75	426.42	0.42	-23.66	155	69.9	0.250 U	210	0.682	1.0
MW-8R	04/21/09	49.17	6.81	309.61	0.54	-167.35	134	47.5	0.250 U	21	0.375	0.0
MW-8R	06/23/09	61.01	6.69	404.48	0.22	17.20	168	45.7	0.250 U	100	0.719	2.0
MW-8R	08/18/09	68.36	6.55	568.94	0.11	-5.74	208	40.6	0.250 U	240	0.945	1.0
MW-8R	10/26/09	62.15	6.73	1,126.47	3.00	201.58	138	503	0.380	120	0.418	0.5
MW-8R	10/26/10	60.46	6.68	1,272.61	3.23	-24.65	223	376	0.250 U	220	0.497	1.0
MW-8R	12/14/11	52.84	6.57	663.65	0.75	-10.00	185	70.9	0.250 U	150	0.780	0.2
MW-8R	12/14/12	53.45	6.88	476.09	8.02	219.79	155	163	0.250 U	3.0 U	0.0061	1.0
MW-8R	12/17/13	54.35	6.66	470.98	0.43	-183.41	187	37.4	0.250 U	62	0.229	0.2
MW-8R	12/10/14	56.31	6.97	604.21	6.50	214.86	150	84	0.25 U	3 U	0.0206	0.0
MW-8R	07/25/17	63.08	6.29	428.73	0.78	129.8	NA	20.6	0.250 U	110	0.085	0.0
MW-8R	03/20/18	48.54	6.86	355.34	0.49	104.9	NA	NA	NA	NA	NA	NA
MW-8R	06/29/18	56.40	6.81	431.53	0.00	103.4	NA	28.5	0.250 U	4	0.020	0.0
MW-8R	11/29/18	56.56	7.08	391.20	1.52	124.0	NA	53.3	0.38	3.0 U	0.038	0.0
MW-E	07/26/17	59.72	6.68	1,317.2	0.07	-96.6	NA	42.3	0.250 U	6,200	3.800	7.0
MW-E-R	03/20/18	51.48	6.60	1,506.60	0.01	-99.6	NA	NA	NA	NA	NA	NA
MW-E-R	06/27/18	59.55	6.58	1,704.60	0.00	-144.3	NA	1.5 U	0.250 U	23,000	11.800	4.5
MW-E-R	11/27/18	60.04	6.76	1,087.9	1.63	-87.7	NA	1.5 U	0.25 U	9,600	8.130	7.0

**Table 3-5**  
**Summary of Groundwater Analytical Data**  
**Natural Attenuation Parameters**  
**Former Unocal Edmonds Bulk Fuel Terminal**  
**11720 Unoco Road**  
**Edmonds, Washington**

Monitoring Well	Date Sampled	Temperature (°F) <sup>1</sup>	pH <sup>1</sup>	Conductivity (µS/cm) <sup>1</sup>	DO (mg/L) <sup>1</sup>	ORP (mV) <sup>1</sup>	Total Alkalinity (mg/L as CaCO <sub>3</sub> ) <sup>2</sup>	Sulfate (mg/L) <sup>3</sup>	Nitrate (mg/L) <sup>3</sup>	Methane (µg/L) <sup>4</sup>	Manganese (mg/L) <sup>5</sup>	Ferrous Iron by Field Measurement (mg/L) <sup>6</sup>
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**Notes:**

<sup>1</sup>: Temperature, pH, DO, conductivity and ORP measured using an In-Situ® 9500 and flow through cell.

<sup>2</sup>: Total Alkalinity analyzed using EPA method 310.1

<sup>3</sup>: Sulfate and nitrate analyzed by EPA method 300.0.

<sup>4</sup>: Methane analyzed using method RSK 175.

<sup>5</sup>: Manganese analyzed using EPA method 6020.

<sup>6</sup>: Ferrous iron field measurement analyzed using a Hach field kit.

°F = Degrees Fahrenheit

µS/cm = microsiemens per centimeter

DO = Dissolved oxygen

mg/L = milligrams per liter

µg/L = micrograms per liter

ORP = Oxidation-reduction potential

mV = millivolts

CaCO<sub>3</sub> = Calcium carbonate

EPA = Environmental Protection Agency

NA = Not Analyzed

^ = Measurement error.

<sup>DB2</sup> = Wells located within the DB-2 excavation footprint and decommissioned during the construction work related to DB-2 excavation activities in August 2017.

**Lab Qualifiers**

**Definition**

D	Sample required dilution due to high concentrations of target analyte.
U	The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
UJ	The compound was analyzed for but not detected. The associated value is the estimated compound quantitation limit.
W	The analysis holding time was not met.
P	Due to interfering peaks on the chromatogram, the value reported for methane represents the lowest reporting limit attainable.

**Table 4-1**  
**Groundwater Extraction Data**  
**Former Unocal Edmonds Bulk Fuel Terminal**  
**11720 Unoco Road**  
**Edmonds, Washington**

Date and Time (mm/dd/yy hh:mm <sup>1</sup> )	DPE System Enclosure LEL (Meter GT7911) <sup>2</sup>	DPE System Transfer Pump Total Operating Hours (Meter P-5501)	Number of Active Groundwater Extraction Wells (out of 14 Wells <sup>3</sup> )	Number of Active Soil Vapor Extraction Wells (out of 16 Wells <sup>4</sup> )	Groundwater Extracted Volume (Totalizer FT7001)	Groundwater Extracted Volume (calculated per period) <sup>5</sup>	Instantaneous System Flow Rate (Meter FT7001)	NPDES Discharge Sample Collected	NPDES Discharge pH Measured	Comments / System Status
Units	% LEL	hours	No. Wells	No. Wells	gal	gal	gpm	Yes/No	pH units	
NPDES Permit No. WA0991007 Effluent Limitations	--	--	--	--	--	--	100	Weekly Sample Outfall #002	6<pH<9	
<b>DPE System Groundwater Extraction Testing Start-up: 12/1/17</b>										
<b>DPE System Soil Groundwater Extraction Effective Start-up: 12/5/17</b>										
12/5/17 11:35	0.0	88.5	13	0	272,728 <sup>6</sup>	271,313	47.40	Yes	#N/A	KO Transfer Pump offline - No Discharge
12/8/17 9:50	0.0	145.6	13	0	443,123	170,395	46.90	No	#N/A	KO Transfer Pump offline - No Discharge
12/13/17 8:55	0.0	175.8	13	15	533,537	90,414	52.10	No	#N/A	SVE-1 and SVE-2 are 10% Open - No Discharge
12/13/17 13:47	0.0	180.1	13	15	546,329	12,792	52.50	No	#N/A	No Discharge
12/14/17 10:00	0.0	198.0	13	15	600,138	53,809	48.50	Yes	8.02	
12/20/17 12:30	0.0	268.0	13	15	808,360	208,222	50.30	Yes	7.30	
12/27/17 11:45	1.5	362.3	13	15	1,078,783	270,423	47.10	Yes	7.44	
1/5/18 16:11	0.0	457.5	13	15	1,350,443	271,660	49.30	Yes	6.87	
1/9/18 16:10	0.5	467.2	13	15	1,379,660	29,217	50.20	Yes	7.08	
1/18/18 14:00	0.0	532.4	11	15	1,567,587	187,927	47.00	Yes	8.08	
1/24/18 13:30	0.0	606.1	13	15	1,771,575	203,988	70.80	Yes	7.58	
2/1/18 10:00	0.0	719.5	13	15	2,184,441	412,866	50.00	Yes	7.58	
2/8/18 9:45	0.0	765.7	7	7	2,336,768	152,327	59.10	Yes	7.70	
2/13/18 9:00	0.0	801.7	7	7	2,452,399	115,631	52.20	Yes	7.78	
2/20/18 13:30	0.0	869.5	10	7	2,645,606	193,207	49.00	Yes	7.73	
2/28/18 13:00	0.0	960.8	9	7	2,862,506	216,900	35.70	Yes	7.85	
3/8/18 10:30	0.0	1,038.8	6	6	3,026,377	163,871	40.30	Yes	7.75	
3/14/18 11:30	0.0	1,122.1	6	6	3,164,585	138,208	32.20	Yes	7.70	
5/8/18 12:30	0.0	1,122.1	14	14	3,164,585	0	62.10	Yes	7.13	Start at 0, Totalizer reset
5/17/18 13:00	0.0	1192.7	4	6	3,387,553	222,968	52.40	Yes	8.04	
5/23/18 14:45	0.0	1,217.1	4	6	3,441,445	53,892	50.40	Yes	7.98	
5/29/18 13:15	0.0	1,248.5	10	12	3,523,835	82,390	58.50	Yes	7.89	
6/7/18 12:30	0.0	1,290.4	10	12	3,673,007	149,172	81.20	Yes	8.15	
6/15/18 10:00	0.0	1,344.9	11	13	3,878,554	205,547	77.70	Yes	8.19	
7/5/18 11:40	0.0	1,428.5	4	6	4,198,836	320,282	70.30	Yes	8.17	
7/11/18 10:45	0.0	1,465.6	8	10	4,329,157	130,321	73.10	Yes	7.46	
7/19/18 13:00	0.0	1,472.5	8	10	4,355,511	26,354	73.00	No	#N/A	No Discharge
7/26/18 14:00	0.0	1,533.7	8	10	4,571,684	216,173	70.50	Yes	8.15	
8/3/18 15:00	0.0	1,582.7	4	6	4,739,433	167,749	67.60	Yes	8.13	
8/7/18 12:00	0.0	1,606.4	4	6	4,832,209	92,776	64.90	Yes	8.68	
8/15/18 13:00	0.0	1,649.5	4	6	4,998,519	166,310	68.40	Yes	7.96	
10/10/18 16:55	0.0	1,650.9	8	0	5,004,254	5,735	57.80	Yes	8.50	
10/18/18 14:00	0.0	1,656.1	6	6	5,018,900	14,646	57.60	Yes	7.90	
10/26/18 16:00	0.0	1,662.1	9	6	5,032,408	13,508	63.40	Yes	7.55	
11/7/18 16:00	0.0	1,663.7	9	9	5,035,905	3,497	68.00	Yes	7.81	

**Table 4-1  
Groundwater Extraction Data  
Former Unocal Edmonds Bulk Fuel Terminal  
11720 Unoco Road  
Edmonds, Washington**

Date and Time (mm/dd/yy hh:mm <sup>1</sup> )	DPE System Enclosure LEL (Meter GT7911) <sup>2</sup> .	DPE System Transfer Pump Total Operating Hours (Meter P-5501)	Number of Active Groundwater Extraction Wells (out of 14 Wells <sup>3</sup> )	Number of Active Soil Vapor Extraction Wells (out of 16 Wells <sup>4</sup> )	Groundwater Extracted Volume (Totalizer FT7001)	Groundwater Extracted Volume (calculated per period) <sup>5</sup> .	Instantaneous System Flow Rate (Meter FT7001)	NPDES Discharge Sample Collected	NPDES Discharge pH Measured	Comments / System Status
Units	% LEL	hours	No. Wells	No. Wells	gal	gal	gpm	Yes/No	pH units	
NPDES Permit No. WA0991007 Effluent Limitations	--	--	--	--	--	--	100	Weekly Sample Outfall #002	6<pH<9	
11/13/18 13:00	0.0	1,700.4	13	13	5,157,564	121,659	61.80	Yes	8.66	
11/21/18 14:00	0.0	1,748.1	8	8	5,313,850	156,286	58.80	Yes	7.86	
1/11/19 10:00	0.0	1,823.4	4	0	5,602,531	288,681	74.80	Yes	7.21	

**Notes**  
**Former Unocal Edmonds Bulk Fuel Terminal**  
**11720 Unoco Road**  
**Edmonds, Washington**

Data Sheet Name	Notes
<b>Table 4-1</b> <b>Groundwater</b> <b>Extraction Data</b>	<sup>1</sup> hh:mm in data sheets is reported in 24 hour format. Date of the flow reading, sample collected and sent to the laboratory for analysis within 24 hours of flow reading. <sup>2</sup> % LEL should remain below 10 % <sup>3</sup> Groundwater extraction wells includes DPE-1, DPE-2, DPE-3, DPE-4, DPE-5, DPE-6, DPE-7, DPE-8, DPE-9, DPE-10, DPE-11, DPE-12, DPE-13 and DPE-14. <sup>4</sup> Soil vapor extraction wells includes DPE-1, DPE-2, DPE-3, DPE-4, DPE-5, DPE-6, DPE-7, DPE-8, DPE-9, DPE-10, DPE-11, DPE-12, DPE-13, DPE-14, SVE-1 and SVE-2. <sup>5</sup> Groundwater Extracted Volume (calculated per period) = Groundwater Extracted Volume Reading Period P - Groundwater Extracted Volume Reading Period P-1 <sup>6</sup> The totalizer FT7001 initial reading pre-activities was 1,414.98 gallons DPE well = dual phase extraction well; remediation well used for both groundwater and soil vapor extraction gal = gallons gpm = gallons per minute LEL = lower explosive level #N/A = not applicable, not available NPDES = National Pollutant Discharge Elimination System SVE well = soil vapor extraction well; remediation well used for soil vapor extraction % = percent



Table 4-2  
Vapor Extraction Data  
Former Unocal Edmonds Bulk Fuel Terminal  
11720 Unoco Road  
Edmonds, Washington

Date and Time	Soil Vapor Extraction Operation Data				Extracted Soil Vapor Data - Pre-Blower				Extracted Soil Vapor Data - Post-Blower					Mass Removal Calculation			Comments	
	Blower Cumulative Operating Period		Blower Operating Period	Manual Dilution Valve	Vacuum Pre-dilution (PT-701)	Vacuum Post-dilution (PT-702)	Temperature (TT-701)	SVE System Flow Rate (FT-702)	Pressure (PT703)	Temperature (TT-704)	SVE System Flow Rate (FT-701)	Post-Blower VOCs Concentration <sup>3.</sup>	Lower Explosive Limit <sup>4.</sup>	Post-Blower GRO Concentration <sup>5.</sup>	Period VOCs Mass Removal Rate <sup>6.</sup>	Period Discharge Time <sup>7.</sup>		Cumulative VOCs Mass Removed <sup>8.</sup>
mm/dd/yy hh:mm <sup>1.</sup>	Blower ID <sup>2.</sup>	hours	hours	% open	in Hg	in Hg	°F	scfm	in H <sub>2</sub> O	°F	scfm	ppmv	%	ppmv	lbs/day	days	lbs	
<b>DPE System Soil Vapor Extraction Testing: 12/05/17</b>																		
<b>DPE System Soil Vapor Extraction Start-up: 12/11/17</b>																		
12/13/17 9:02	701	46.3	0.0	0	0.4	10.0	42.3	350	15.0	56.2	325	378.8	6	#N/A	40.32	0.0	0.00	
	702	33.3	0.0	0														
	703	14.1	0.0	Closed														
12/13/17 13:59	701	51.1	5.2	0	0.4	10.1	48.6	350	15.0	63.7	323	364.6	0	290	38.57	0.2	8.36	
	702	38.1	5.2	0														
	703	14.1	0.0	Closed														
12/14/17 14:00	701	71.9	20.4	0	0.4	9.8	46.3	345	16.0	61.6	330	308.2	0	#N/A	33.31	0.9	36.67	
	702	58.9	20.4	0														
	703	14.1	0.0	Closed														
12/20/17 12:40	701	149.8	78.3	0	0.6	12.7	47.4	385	14.0	83.8	315	177.5	0	160	18.31	3.3	96.41	
	702	136.0	77.9	0														
	703	14.1	0.0	Closed														
12/27/17 11:55	701	244.5	94.7	0	0.9	11.1	49.5	375	16.6	71.6	344	129.8	0	100	14.62	3.9	154.12	
	702	230.1	94.1	0														
	703	14.1	0.0	Closed														
1/5/18 14:15	701	274.9	30.4	0	1.0	11.7	50.8	375	15.8	82.5	336	121.9	0	#N/A	13.41	3.9	206.83	
	702	324.4	94.3	0														
	703	14.1	0.0	Closed														
1/9/18 16:15	701	282.8	7.9	0	1.3	6.7	47.8	255	8.3	52.0	215	95.2	0	#N/A	6.70	0.3	209.03	
	702	329.2	4.8	0														
	703	14.1	0.0	Closed														
1/18/18 14:00	701	351.8	69.0	0	1.3	6.7	51.2	250	8.1	55.2	202	44.1	0	#N/A	2.92	2.9	217.42	
	702	350.8	21.6	Closed														
	703	14.1	0.0	Closed														
1/24/18 15:20	701	362.0	10.2	0	1.4	17.2	47.8	380	9.4	99.5	232	39.0	0	#N/A	2.96	3.6	228.14	
	702	437.6	86.8	0														
	703	14.1	0.0	Closed														
2/1/18 10:00	701	502.4	140.4	0	0.8	9.3	46.9	315	13.0	43.5	305	25.9	0	#N/A	2.59	5.9	243.33	
	702	578.5	140.9	0														
	703	14.1	0.0	Closed														
2/8/18 9:50	701	580.6	78.2	0	0.9	7.5	50.5	233	6.1	35.1	171	17.1	0	#N/A	0.96	3.3	246.45	
	702	617.9	39.4	0														
	703	14.1	0.0	Closed														
2/13/18 9:20	701	697.6	117.0	0	1.3	1.7	39.2	240	10.8	0.0	332	172.6	11	#N/A	18.77	4.9	337.94	
	702	617.9	0.0	0														
	703	14.1	0.0	Closed														
2/20/18 13:40	701	729.1	31.5	0	0.9	8.1	44.5	235	6.0	28.3	165	39.1	0	18	2.11	1.5	341.16	
	702	654.5	36.6	Closed														
	703	14.1	0.0	Closed														
2/28/18 12:45	701	850.6	121.5	0	1.3	8.5	50.7	275	12.1	32.1	245	22.2	0	#N/A	1.78	5.1	350.18	
	702	754.2	99.7	0														
	703	14.1	0.0	Closed														
3/8/18 10:50	701	914.6	64.0	0	1.4	9.9	47.8	270	8.5	0.0	220	18.1	0	#N/A	1.30	4.7	356.24	
	702	865.8	111.6	0														
	703	14.1	0.0	Closed														

Table 4-2  
Vapor Extraction Data  
Former Unocal Edmonds Bulk Fuel Terminal  
11720 Unoco Road  
Edmonds, Washington

Date and Time	Soil Vapor Extraction Operation Data				Extracted Soil Vapor Data - Pre-Blower				Extracted Soil Vapor Data - Post-Blower					Mass Removal Calculation			Comments	
	Blower Cumulative Operating Period		Blower Operating Period	Manual Dilution Valve	Vacuum Pre-dilution (PT-701)	Vacuum Post-dilution (PT-702)	Temperature (TT-701)	SVE System Flow Rate (FT-702)	Pressure (PT703)	Temperature (TT-704)	SVE System Flow Rate (FT-701)	Post-Blower VOCs Concentration <sup>3</sup>	Lower Explosive Limit <sup>4</sup> (VSP-801)	Post-Blower GRO Concentration <sup>5</sup> (Lab. Data)	Period VOCs Mass Removal Rate <sup>6</sup>	Period Discharge Time <sup>7</sup>		Cumulative VOCs Mass Removed <sup>8</sup>
	mm/dd/yy hh:mm <sup>1</sup>	Blower ID <sup>2</sup>	hours	hours	% open	in Hg	in Hg	°F	scfm	in H <sub>2</sub> O	°F	scfm	ppmv	%	ppmv	lbs/day		days
3/14/18 11:50	701	1,033.4	118.8	0	1.2	11.4	49.2	281	8.7	0.0	208	10.1	0	20	0.69	5.0	359.72	
	702	986.9	121.1	0														
	703	14.1	0.0	Closed														
5/8/18 14:50	701	1,057.1	0.0	0	1.1	6.4	71.1	315	18.5	64.6	350	6.8	0	#N/A	0.78	0.0	359.72	
	702	1,001.7	0.0	0														
	703	14.1	0.0	Closed														
5/18/18 15:15	701	1,082.7	25.6	Closed	0.9	7.0	69.8	213	5.8	71.4	175	5.0	0	34	0.29	7.1	361.76	
	702	1,172.7	171.0	0														
	703	14.1	0.0	Closed														
5/23/18 15:00	701	1,082.7	0.0	Closed	1.3	7.6	79.3	214	5.6	62.2	179	11.1	0	#N/A	0.65	5.9	365.59	
	702	1,314.0	141.3	0														
	703	14.1	0.0	Closed														
5/29/18 19:30	701	1,082.7	0.0	Closed	1.2	1.1	67.9	169	6.4	35.8	188	38.4	0	#N/A	2.36	5.8	379.18	
	702	1,452.0	138.0	0														
	703	14.1	0.0	Closed														
6/7/18 13:40	701	1,164.3	81.6	0	1.7	2.6	65.9	290	17.9	101	350	26.3	0	#N/A	3.01	3.4	389.43	
	702	1,532.8	80.8	0														
	703	14.1	0.0	Closed														
6/15/18 12:15	701	1,258.9	94.6	0	1.1	4.9	74.1	230	10.9	30.8	258	22.0	6	#N/A	1.86	4.1	397.02	
	702	1,630.8	98.0	0														
	703	14.1	0.0	Closed														
7/5/18 11:45	701	1,258.9	0.0	0	1.0	10.3	75.8	245	7.5	58.3	209	17.0	0	#N/A	1.16	7.9	406.26	
	702	1,821.2	190.4	0														
	703	14.1	0.0	Closed														
7/11/18 10:55	701	1,258.9	0.0	0	1.3	6.6	74.0	225	4.5	40.3	246	38.0	0	#N/A	3.06	5.9	424.32	
	702	1,962.8	141.6	0														
	703	14.1	0.0	Closed														
7/19/18 14:00	701	1,258.9	0.0	0	0.9	6.4	73.3	214	2.2	0.0	245	27.0	4	#N/A	2.17	0.5	425.48	
	702	1,975.6	12.8	0														
	703	14.1	0.0	Closed														
7/26/18 14:15	701	1,258.9	0.0	0	1.0	7.1	78.9	264	8.9	0.0	283	21.0	0	#N/A	1.95	5.2	435.60	
	702	2,100.4	124.8	0														
	703	14.1	0.0	Closed														
8/3/18 15:00	701	1,351.4	92.5	0	1.1	5.2	72.5	220	8.1	29.8	250	23.0	0	#N/A	1.88	3.9	442.87	
	702	2,193.1	92.7	0														
	703	14.1	0.0	Closed														
8/7/18 12:10	701	1,351.4	0.0	0	1.1	10.2	76.6	225	5.3	53.0	208	22.0	0	#N/A	1.50	3.9	448.66	
	702	2,285.8	92.7	0														
	703	14.1	0.0	Closed														
8/15/18 13:30	701	1,516.6	165.2	0	1.2	10.7	76.9	235	7.7	55.2	228	21.0	0	#N/A	1.57	7.0	459.59	
	702	2,453.1	167.3	0														
	703	14.1	0.0	Closed														
10/10/18 17:00	701	1,516.6	0.0	Closed	--	--	--	--	--	--	--	--	--	#N/A	--	--	--	
	702	2,453.1	0.0	Closed														
	703	14.1	0.0	Closed														
10/18/18 14:10	701	1,517.4	0.8	0	1.0	5.0	60.4	128	3.3	26.8	149	30.1	9	#N/A	1.47	0.0	459.64	
	702	2,453.3	0.2	0														
	703	14.1	0.0	Closed														

Table 4-2  
Vapor Extraction Data  
Former Unocal Edmonds Bulk Fuel Terminal  
11720 Unoco Road  
Edmonds, Washington

Date and Time	Soil Vapor Extraction Operation Data				Extracted Soil Vapor Data - Pre-Blower				Extracted Soil Vapor Data - Post-Blower					Mass Removal Calculation			Comments	
	Blower Cumulative Operating Period		Blower Operating Period	Manual Dilution Valve	Vacuum Pre-dilution (PT-701)	Vacuum Post-dilution (PT-702)	Temperature (TT-701)	SVE System Flow Rate (FT-702)	Pressure (PT703)	Temperature (TT-704)	SVE System Flow Rate (FT-701)	Post-Blower VOCs Concentration <sup>3.</sup>	Lower Explosive Limit <sup>4.</sup>	Post-Blower GRO Concentration <sup>5.</sup>	Period VOCs Mass Removal Rate <sup>6.</sup>	Period Discharge Time <sup>7.</sup>		Cumulative VOCs Mass Removed <sup>8.</sup>
mm/dd/yy hh:mm <sup>1.</sup>	Blower ID <sup>2.</sup>	hours	hours	% open	in Hg	in Hg	°F	scfm	in H <sub>2</sub> O	°F	scfm	ppmv	%	ppmv	lbs/day	days	lbs	
10/26/18 12:00	701	1,535.1	17.7	0	1.3	1.1	60.8	119	7.7	20.8	167	10.1	0	#N/A	0.55	0.7	460.05	
	702	2,453.3	0.0	0														
	703	14.1	0.0	Closed														
11/7/18 16:05	701	1,538.3	3.2	0	0.8	10.5	53.0	224	8.7	120*	214	18.0	0	#N/A	1.26	0.1	460.22	*TT-704 not working, reading collected from the gauge TI-107
	702	2,453.4	0.1	0														
	703	14.1	0.0	Closed														
11/13/18 13:10	701	1,637.9	99.6	0	0.9	3.7	54.9	218	10.3	120*	285	17.5	0	#N/A	1.63	4.2	466.99	*TT-704 not working, reading collected from the gauge TI-107
	702	2,550.8	97.4	0														
	703	14.1	0.0	Closed														
11/21/18 14:05	701	1,733.0	95.1	0	1.5	7.2	55.6	232	14.1	120*	252	3.8	0	#N/A	0.31	4.0	468.24	* TT-704 not working, reading collected from the gauge TI-107
	702	2,644.7	93.9	0														
	703	14.1	0.0	Closed														

Data Sheet Name	Notes
Table 4-2	<sup>1</sup> hh:mm in data sheets is reported in 24 hour format
Vapor Extraction Data	<sup>2</sup> The SVE system comprises three blowers (701, 702 and 703) inducing vacuum to extract the soil vapors at each DPE and SVE well <sup>3</sup> Post-blower VOCs concentration measured in the field by photoionization detector (PID) reading <sup>4</sup> Lower explosive limit measured in the field by 4-gas multi-meter reading <sup>5</sup> Post-blower GRO concentration analysed by Method United States Environmental Protection Agency TO-15 by Test America Laboratories, Inc. in Tacoma, Washington <sup>6</sup> VOCs mass removal rate calculated using PID reading Mass Removal Rate= flowrate * time * concentration * molecular weight *molar density of air
	$\text{Period VOCs Mass Removal Rate} = (\text{SVE System Flow Rate [scfm]} \times 60 [\text{min}] \times 24 [\text{hr}]) \times \left( \frac{\text{Post-Blower VOCs Concentration [ppmv]}}{10^6} \right) \times \frac{86.2 \left[ \frac{\text{lbs}}{\text{mol}} \right]}{379 \left[ \frac{\text{lbmol}}{\text{scf}} \right]}$
	VOCs (as Hexane) molecular weight = 86.2 lb / [lb mol]. min = minute hr = hour lb = pound Molar density of air = 379 lb mol / scf. lb mol = pound per mole scfm = standard cubic feet per minute scf = standard cubic feet
	<sup>7</sup> Total days of discharge in period (see Date and Time). Period Discharge Time = maximum blower operating period / 24
	<sup>8</sup> Cumulative VOCs mass removed calculated using PID reading Cumulative Mass Removed = mass removal rate * time + previous cumulative mass removed
	$\text{Cumulative VOCs Mass Removed} = \text{Period VOCs Mass Removal Rate} \left[ \frac{\text{lbs}}{\text{day}} \right] \times \text{Period Discharge Time [day]} + \text{previous Cumulative VOCs Mass Removed [lbs]}$
	lb = pound °F = degrees Fahrenheit GRO = Total petroleum hydrocarbons - gasoline range organics. in Hg = inches mercury in H <sub>2</sub> O = inches water Lab. = Laboratory lbs = pounds lbs/day = pounds per day #N/A = not applicable, not available PID = photoionization detector ppmv = parts per million vapor scfm = standard cubic feet per minute SVE = soil vapor extraction VOCs = volatile organic compounds % = percent

**Table 4-3**  
**Vapor Extraction Data – Laboratory Data and Mass Removal**  
**Former Unocal Edmonds Bulk Fuel Terminal**  
**11720 Unoco Road**  
**Edmonds, Washington**

Date and Time	Soil Vapor Extraction Operation Data		GRO Mass Removal Calculation			Benzene Mass Removal Calculation		
	Blower Cumulative Operating Period	SVE System Flow Rate (FT-701)	GRO Concentration <sup>2.</sup> (VSP-801)	GRO Mass Removal Rate <sup>3.</sup>	Cumulative GRO Mass Removed <sup>4.</sup>	Benzene Concentration <sup>5.</sup> (VSP-801)	Benzene Removal Rate <sup>6.</sup>	Cumulative Benzene Mass Removed <sup>7.</sup>
mm/dd/yy hh:mm <sup>1.</sup>	cumulative hours	scfm	ppmv	lbs/day	lbs	ppmv	lbs/day	lbs
<b>DPE System Soil Vapor Extraction Testing: 12/05/17</b>								
<b>DPE System Soil Vapor Extraction Start-up: 12/11/17</b>								
12/14/17 14:00	71.9	330	290	36.36	109	2.4	0.24	0.70
12/20/17 12:40	149.8	315	160	19.15	199	0.91	0.09	1.22
12/27/17 11:55	244.5	344	100	13.07	263	0.48	0.05	1.49
2/20/18 13:40	729.1	165	18	1.13	406	0.28	0.01	2.12
3/14/18 11:50	1,033.4	208	20	1.58	423	0.17	0.01	2.27
5/18/18 15:15	1,172.7	175	34	2.26	434	0.0011	0.00	2.31
7/26/18 14:15	2,100.4	283	17	1.83	513	0.046	0.00	2.38
10/18/18 14:10	2,453.3	149	38	2.15	631	0.640	0.03	2.62

Data Sheet Name	Notes
<b>Table 4-3</b> <b>Vapor Extraction Data – Laboratory Data and Mass Removal</b>	<p>1. hh:mm in data sheets is reported in 24 hour format            2. GRO concentration analysed by Method United States Environmental Protection Agency TO-15 by Test America Laboratories, Inc. in Tacoma, Washington            3. GRO mass removal rate calculated using laboratory concentration            Mass Removal Rate= flowrate * time * concentration * molecular weight *molar density of air</p> <div data-bbox="397 383 1740 473" style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <math display="block">\text{GRO Mass Removal Rate} = (\text{SVE System Flow Rate [scfm]} \times 60 [\text{min}] \times 24 [\text{hr}]) \times \left( \frac{\text{GRO Concentration [ppmv]}}{10^6} \right) \times \frac{100 \left[ \frac{\text{lbs}}{\text{mol}} \right]}{379 \left[ \frac{\text{lbmol}}{\text{scf}} \right]}</math> </div> <div style="display: flex; justify-content: space-between; font-size: small;"> <div data-bbox="397 483 808 614"> <p>GRO molecular weight = 100 lb / [lb mol].  min = minute  hr = hour  lb = pound</p> </div> <div data-bbox="1258 483 1647 614"> <p>Molar density of air = 379 lb mol / scf.  lb mol = pound per mole  scfm = standard cubic feet per minute  scf = standard cubic feet</p> </div> </div> <p>4. Cumulative GRO mass removed calculated using laboratory concentration</p> <div data-bbox="397 655 2750 745" style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <math display="block">\text{Cumulative GRO Mass Removed} = (\text{Average (Period GRO Mass Removal Rate} \left[ \frac{\text{lbs}}{\text{day}} \right] + \text{Previous Period GRO Mass Removal Rate} \left[ \frac{\text{lbs}}{\text{day}} \right]) \times \frac{\Delta \text{discharge hours}}{24} + \text{Cumulative GRO Mass Removed Previous Period [lbs]}</math> </div> <p>lb = pound</p> <p>5. Benzene concentration analysed by Method United States Environmental Protection Agency TO-15 by Test America Laboratories, Inc. in Tacoma, Washington  6. Benzene mass removal rate calculated using laboratory concentration  Mass Removal Rate= flowrate * time * concentration * molecular weight *molar density of air</p> <div data-bbox="397 897 1818 987" style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <math display="block">\text{Benzene Mass Removal Rate} = (\text{SVE System Flow Rate [scfm]} \times 60 [\text{min}] \times 24 [\text{hr}]) \times \left( \frac{\text{Benzene Concentration [ppmv]}}{10^6} \right) \times \frac{78.11 \left[ \frac{\text{lbs}}{\text{mol}} \right]}{379 \left[ \frac{\text{lbmol}}{\text{scf}} \right]}</math> </div> <div style="display: flex; justify-content: space-between; font-size: small;"> <div data-bbox="397 997 870 1128"> <p>Benzene molecular weight = 78.11 lb / [lb mol].  min = minute  hr = hour  lb = pound</p> </div> <div data-bbox="1258 997 1647 1128"> <p>Molar density of air = 379 lb mol / scf.  lb mol = pound per mole  scfm = standard cubic feet per minute  scf = standard cubic feet</p> </div> </div> <p>7. Cumulative benzene mass removed calculated using laboratory concentration</p> <div data-bbox="397 1169 2937 1260" style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <math display="block">\text{Cumulative Benzene Mass Removed} = (\text{Average (Period Benzene Mass Removal Rate} \left[ \frac{\text{lbs}}{\text{day}} \right] + \text{Previous Period Benzene Mass Removal Rate} \left[ \frac{\text{lbs}}{\text{day}} \right]) \times \frac{\Delta \text{discharge hours}}{24} + \text{Cumulative Benzene Mass Removed Previous Period [lbs]}</math> </div> <p>lb = pound</p> <p>GRO = Total petroleum hydrocarbons - gasoline range organics.  lbs = pounds  lbs/day = pounds per day  ppmv = parts per million vapor  scfm = standard cubic feet per minute  SVE = soil vapor extraction</p>

Table 4-4  
Dual-Phase Extraction Well Groundwater Operational Data  
Former Unocal Edmonds Bulk Fuel Terminal  
11720 Unoco Road  
Edmonds, Washington

DPE-01												
DPE Well ID	Date and Time	Transducer Depth	Water above Transducer (LT-4001)	Depth to Water <sup>2</sup>	Casing Elevation	Groundwater Elevation	Variable Frequency Drive Setting	Vacuum Applied	Extracted Groundwater Volume Totalizer <sup>3</sup>	Periodic Extracted Groundwater Volume	Instantaneous DPE Well Groundwater Flow Rate <sup>4</sup>	Comments
	mm/dd/yy hh:mm <sup>1</sup>	ft btoc	ft	ft btoc	ft NAVD88	ft NAVD88	High/Low	yes/no	gal	gal	gpm	
DPE-01	11/28/17 8:47	#N/A	#N/A	7.75	14.58	6.83	#N/A	#N/A	174.4	#N/A	#N/A	DPE System Baseline Event before System Startup - Pump off
DPE-01	12/5/17 11:35	26.50	2.00	24.50	14.58	-9.92	2 / 0.5	No	4,291	4,116.60	#N/A	Groundwater elevation estimated based on transducer setting
DPE-01	12/13/17 9:30	26.50	4.40	22.10	14.58	-7.52	2 / 0.5	Yes	7,715.35	3,424.35	0.0	Low yield
DPE-01	12/13/17 14:00	26.50	1.20	25.30	14.58	-10.72	2 / 0.5	Yes	7,953.10	237.75	0.0	Low yield
DPE-01	12/14/17 10:25	26.50	1.80	24.70	14.58	-10.12	2 / 0.5	Yes	8,880.60	927.50	0.0	Low yield
DPE-01	12/20/17 12:50	26.50	3.30	23.20	14.58	-8.62	2 / 0.5	Yes	11,126.90	2,246.30	0.0	Low yield
DPE-01	12/27/17 12:15	26.50	3.64	22.86	14.58	-8.28	2 / 0.5	Yes	14,887.30	3,760.40	0.0	Low yield
DPE-01	1/5/18 16:20	26.50	1.00	25.50	14.58	-10.92	2 / 0.5	Yes	18,939.00	4,051.70	0.0	Low yield
DPE-01	1/9/18 16:25	26.50	1.00	25.50	14.58	-10.92	4 / 0.5	Yes	19,525.90	586.90	1.0	
DPE-01	1/18/18 14:20	26.50	2.00	24.50	14.58	-9.92	4 / 0.5	Yes	23,294.10	3,768.20	0.0	Low yield
DPE-01	1/24/18 13:30	26.50	2.00	24.50	14.58	-9.92	2 / 0.5	Yes	27,517.80	4,223.70	0.0	Low yield
DPE-01	2/1/18 10:10	26.50	4.65	21.85	14.58	-7.27	2 / 0.5	Yes	33,542.00	6,024.20	0.0	Low yield
DPE-01	2/8/18 10:00	26.50	4.24	22.26	14.58	-7.68	2 / 0.5	Yes	37,141.60	3,599.60	0.0	Low yield
DPE-01	2/13/18 9:50	26.50	1.00	25.50	14.58	-10.92	2 / 0.5	No	41,896.00	4,754.40	1.0	
DPE-01	2/20/18 14:00	26.50	2.00	24.50	14.58	-9.92	2 / 0.5	Yes	45,858.20	3,962.20	0.0	Low yield
DPE-01	2/28/18 14:00	26.50	0.80	25.70	14.58	-11.12	2 / 0.5	Yes	50,555.80	4,697.60	0.0	Low yield
DPE-01	3/8/18 11:30	26.50	2.00	24.50	14.58	-9.92	2 / 0.5	Yes	55,055.20	4,499.40	0.0	Low yield
DPE-01	3/14/18 12:00	26.50	4.95	21.55	14.58	-6.97	2 / 0.5	Yes	60,016.90	4,961.70	0.0	Low yield
DPE-01	5/8/18 13:00	26.50	4.88	21.62	14.58	-7.04	2 / 0.5	Yes	60,641.10	624.20	0.0	Low yield
DPE-01	5/17/18 15:45	26.50	13.11	13.39	14.58	1.19	2 / 0.5	No	67,397.40	6,756.30	0.0	Off
DPE-01	5/23/18 15:30	26.50	14.01	12.49	14.58	2.09	2 / 0.5	No	67,397.40	0.00	0.0	Off
DPE-01	5/29/18 16:30	26.50	1.15	25.35	14.58	-10.77	2 / 0.5	Yes	67,499.30	101.90	0.0	
DPE-01	6/7/18 13:15	26.50	0.56	25.94	14.58	-11.36	2 / 0.5	Yes	70,988.90	3,489.60	0.0	
DPE-01	6/15/18 13:00	26.50	2.89	23.61	14.58	-9.03	2 / 0.5	Yes	74,571.40	3,582.50	0.0	
DPE-01	6/18/18 12:20	26.50	0.49	26.02	14.58	-11.44	#N/A	#N/A	#N/A	#N/A	#N/A	
DPE-01	7/5/18 12:00	26.50	13.97	12.53	14.58	2.05	2 / 0.5	No	79,523.10	4,951.70	0.0	Off
DPE-01	7/11/18 12:30	26.50	3.27	23.23	14.58	-8.65	2 / 0.5	Yes	79,658.60	135.50	0.0	
DPE-01	7/19/18 14:30	26.50	1.33	25.17	14.58	-10.59	2 / 0.5	Yes	80,377.10	718.50	0.0	Off
DPE-01	7/26/18 15:00	26.50	0.50	26.00	14.58	-11.42	2 / 0.5	Yes	85,657.40	5,280.30	0.0	
DPE-01	8/3/18 15:10	26.50	9.14	17.36	14.58	-2.78	2 / 0.5	No	89,604.50	3,947.10	0.0	Off
DPE-01	8/7/18 12:45	26.50	13.63	12.87	14.58	1.71	2 / 0.5	No	89,604.50	0.00	0.0	Off
DPE-01	8/15/18 14:00	26.50	13.04	13.46	14.58	1.12	2 / 0.5	No	89,604.50	0.00	0.0	Off
DPE-01	10/10/18 17:05	23.00	1.91	21.09	14.58	-6.51	2 / 0.5	No	89,772.40	167.90	1.2	Recalibrated transducer depth after fall restart
DPE-01	10/18/18 14:15	23.00	0.86	22.14	14.58	-7.56	2 / 0.5	Yes	90,691.00	918.60	1.2	
DPE-01	10/26/18 16:10	23.00	0.85	22.15	14.58	-7.57	2 / 0.5	Yes	91,745.90	1,054.90	1.2	
DPE-01	11/7/18 16:10	23.00	0.60	22.40	14.58	-7.82	2 / 0.5	Yes	91,977.80	231.90	1.2	
DPE-01	11/13/18 13:20	23.00	0.90	22.10	14.58	-7.52	2 / 0.5	Yes	96,666.60	4,688.80	0.0	
DPE-01	11/21/18 14:10	23.00	0.75	22.25	14.58	-7.67	2 / 0.5	Yes	100,764.30	4,097.70	0.0	
DPE-01	1/11/19 10:30	23.00	15.13	7.87	14.58	6.71	2 / 0.5	No	103,258.10	2,493.80	0.0	Off

Table 4-4  
Dual-Phase Extraction Well Groundwater Operational Data  
Former Unocal Edmonds Bulk Fuel Terminal  
11720 Unoco Road  
Edmonds, Washington

DPE-02												
DPE Well ID	Date and Time	Transducer Depth	Water above Transducer (LT-4002)	Depth to Water <sup>2</sup>	Casing Elevation	Groundwater Elevation	Variable Frequency Drive Setting	Vacuum Applied	Extracted Groundwater Volume Totalizer <sup>3</sup>	Periodic Extracted Groundwater Volume	Instantaneous DPE Well Groundwater Flow Rate <sup>4</sup>	Comments
	mm/dd/yy hh:mm <sup>1</sup>	ft btoc	ft	ft btoc	ft NAVD88	ft NAVD88	High/Low	yes/no	gal	gal	gpm	
DPE-02	11/28/17 8:49	#N/A	#N/A	7.75	14.88	7.13	#N/A	#N/A	189.13	#N/A	#N/A	DPE System Baseline Event before System Startup - Pump off
DPE-02	12/5/17 11:35	26.50	2.00	24.50	14.88	-9.62	2 / 0.5	No	21,102	20,912.87	#N/A	Groundwater elevation estimated based on transducer setting
DPE-02	12/13/17 9:30	26.50	2.01	24.49	14.88	-9.61	2 / 0.5	Yes	41,602.11	20,500.11	3.6	
DPE-02	12/13/17 14:00	26.50	2.00	24.50	14.88	-9.62	2 / 0.5	Yes	42,655.30	1,053.19	3.8	
DPE-02	12/14/17 10:25	26.50	2.00	24.50	14.88	-9.62	2 / 0.5	Yes	46,726.00	4,070.70	3.8	
DPE-02	12/20/17 12:50	26.50	2.00	24.50	14.88	-9.62	2 / 0.5	Yes	62,273.60	15,547.60	3.8	
DPE-02	12/27/17 0:15	26.50	2.00	24.50	14.88	-9.62	2 / 0.5	Yes	81,107.50	18,833.90	3.6	
DPE-02	1/5/18 16:20	26.50	2.00	24.50	14.88	-9.62	2 / 0.5	Yes	100,386.80	19,279.30	3.6	
DPE-02	1/9/18 16:25	26.50	4.00	22.50	14.88	-7.62	4 / 0.5	Yes	102,562.00	2,175.20	3.4	
DPE-02	1/18/18 14:20	26.50	4.00	22.50	14.88	-7.62	4 / 0.5	Yes	117,908.80	15,346.80	3.8	
DPE-02	1/24/18 13:30	26.50	2.00	24.50	14.88	-9.62	2 / 0.5	Yes	138,159.00	20,250.20	3.2	
DPE-02	2/1/18 10:10	26.50	2.81	23.69	14.88	-8.81	2 / 0.5	Yes	172,231.90	34,072.90	3.8	
DPE-02	2/8/18 10:00	26.50	2.00	24.50	14.88	-9.62	2 / 0.5	Yes	192,486.30	20,254.40	4.8	
DPE-02	2/13/18 9:50	26.50	2.00	24.50	14.88	-9.62	2 / 0.5	No	221,598.10	29,111.80	4.2	
DPE-02	2/20/18 14:00	26.50	2.00	24.50	14.88	-9.62	2 / 0.5	Yes	247,104.00	25,505.90	4.4	
DPE-02	2/28/18 14:00	26.50	2.00	24.50	14.88	-9.62	2 / 0.5	Yes	275,636.50	28,532.50	4.0	
DPE-02	3/8/18 11:30	26.50	7.51	18.99	14.88	-4.11	2 / 0.5	Yes	300,986.90	25,350.40	4.6	
DPE-02	3/14/18 12:00	26.50	2.00	24.50	14.88	-9.62	2 / 0.5	Yes	332,181.90	31,195.00	3.9	
DPE-02	5/8/18 13:00	26.50	2.00	24.50	14.88	-9.62	2 / 0.5	Yes	335,810.50	3,628.60	4.0	
DPE-02	5/17/18 15:45	26.50	12.63	13.87	14.88	1.01	2 / 0.5	No	377,365.90	41,555.40	0.0	Off
DPE-02	5/23/18 15:30	26.50	14.03	12.47	14.88	2.41	2 / 0.5	No	377,365.90	0.00	0.0	Off
DPE-02	5/29/18 16:30	26.50	1.75	24.75	14.88	-9.87	2 / 0.5	Yes	377,688.00	322.10	3.8	
DPE-02	6/7/18 13:15	26.50	2.12	24.38	14.88	-9.50	2 / 0.5	Yes	398,838.90	21,150.90	4.0	
DPE-02	6/15/18 13:00	26.50	2.00	24.50	14.88	-9.62	2 / 0.5	Yes	422,423.80	23,584.90	4.0	
DPE-02	6/18/18 12:20	26.50	2.01	24.49	14.88	-9.61	#N/A	#N/A	#N/A	#N/A	#N/A	
DPE-02	7/5/18 12:00	26.50	13.88	12.62	14.88	2.26	2 / 0.5	No	451,191.60	28,767.80	0.0	Off
DPE-02	7/11/18 12:30	26.50	8.86	17.64	14.88	-2.76	2 / 0.5	Yes	451,321.20	129.60	4.8	
DPE-02	7/19/18 14:30	26.50	4.93	21.57	14.88	-6.69	2 / 0.5	Yes	455,610.10	4,288.90	5.0	
DPE-02	7/26/18 15:00	26.50	6.50	20.00	14.88	-5.12	2 / 0.5	Yes	489,067.10	33,457.00	5.2	
DPE-02	8/3/18 15:10	26.50	11.60	14.90	14.88	-0.02	2 / 0.5	No	512,926.90	23,859.80	0.0	Off
DPE-02	8/7/18 12:45	26.50	13.30	13.20	14.88	1.68	2 / 0.5	No	512,926.90	0.00	0.0	Off
DPE-02	8/15/18 14:00	26.50	13.16	13.34	14.88	1.54	2 / 0.5	No	512,926.90	0.00	0.0	Off
DPE-02	10/10/18 17:05	23.00	2.20	20.80	14.88	-5.92	2 / 0.5	No	513,479.10	552.20	5.4	Recalibrated transducer depth after fall restart
DPE-02	10/18/18 14:15	23.00	2.38	20.62	14.88	-5.74	2 / 0.5	Yes	517,278.20	3,799.10	5.2	
DPE-02	10/26/18 16:10	23.00	1.83	21.17	14.88	-6.29	2 / 0.5	Yes	522,271.30	4,993.10	5.2	
DPE-02	11/7/18 16:10	23.00	2.40	20.60	14.88	-5.72	2 / 0.5	Yes	523,356.20	1,084.90	5.0	
DPE-02	11/13/18 13:20	23.00	2.00	21.00	14.88	-6.12	2 / 0.5	Yes	548,623.80	25,267.60	4.2	
DPE-02	11/21/18 14:10	23.00	2.00	21.00	14.88	-6.12	2 / 0.5	Yes	571,650.10	23,026.30	4.4	
DPE-02	1/11/19 10:30	23.00	16.05	6.95	14.88	7.93	2 / 0.5	No	585,292.80	13,642.70	0.0	Off



Table 4-4  
Dual-Phase Extraction Well Groundwater Operational Data  
Former Unocal Edmonds Bulk Fuel Terminal  
11720 Unoco Road  
Edmonds, Washington

DPE-03												
DPE Well ID	Date and Time	Transducer Depth	Water above Transducer (LT-4003)	Depth to Water <sup>2</sup>	Casing Elevation	Groundwater Elevation	Variable Frequency Drive Setting	Vacuum Applied	Extracted Groundwater Volume Totalizer <sup>3</sup>	Periodic Extracted Groundwater Volume	Instantaneous DPE Well Groundwater Flow Rate <sup>4</sup>	Comments
	mm/dd/yy hh:mm <sup>1</sup>	ft btoc	ft	ft btoc	ft NAVD88	ft NAVD88	High/Low	yes/no	gal	gal	gpm	
DPE-03	11/28/17 8:40	#N/A	#N/A	7.04	13.94	6.90	#N/A	#N/A	41.15	#N/A	#N/A	DPE System Baseline Event before System Startup - Pump off
DPE-03	12/5/17 11:35	18.50	2.00	16.50	13.94	-2.56	2 / 0.5	No	32,464	32,422.85	#N/A	Groundwater elevation estimated based on transducer setting
DPE-03	12/13/17 9:30	18.50	3.70	14.80	13.94	-0.86	2 / 0.5	Yes	64,706.16	32,242.16	5.6	
DPE-03	12/13/17 14:00	18.50	3.60	14.90	13.94	-0.96	2 / 0.5	Yes	66,126.60	1,420.44	5.6	
DPE-03	12/14/17 10:25	18.50	3.30	15.20	13.94	-1.26	2 / 0.5	Yes	72,950.20	6,823.60	5.4	
DPE-03	12/20/17 12:50	18.50	4.50	14.00	13.94	-0.06	2 / 0.5	Yes	99,486.30	26,536.10	5.4	
DPE-03	12/27/17 12:15	18.50	4.34	14.16	13.94	-0.22	2 / 0.5	Yes	132,783.20	33,296.90	6.0	
DPE-03	1/5/18 16:20	18.50	5.25	13.25	13.94	0.69	2 / 0.5	Yes	165,740.30	32,957.10	5.6	
DPE-03	1/9/18 16:25	18.50	5.59	12.91	13.94	1.03	4 / 0.5	Yes	168,925.20	3,184.90	5.4	
DPE-03	1/18/18 14:20	18.50	5.75	12.75	13.94	1.19	4 / 0.5	Yes	199,280.40	30,355.20	5.6	
DPE-03	1/24/18 13:30	18.50	5.50	13.00	13.94	0.94	2 / 0.5	Yes	224,989.30	25,708.90	5.8	
DPE-03	2/1/18 10:10	18.50	4.80	13.70	13.94	0.24	2 / 0.5	Yes	273,883.30	48,894.00	5.8	
DPE-03	2/8/18 10:00	18.50	4.90	13.60	13.94	0.34	2 / 0.5	Yes	301,693.20	27,809.90	5.8	
DPE-03	2/13/18 9:50	18.50	3.22	15.28	13.94	-1.34	2 / 0.5	No	342,654.30	40,961.10	6.0	
DPE-03	2/20/18 14:00	18.50	5.19	13.31	13.94	0.63	2 / 0.5	Yes	378,688.10	36,033.80	6.0	
DPE-03	2/28/18 14:00	18.50	4.73	13.77	13.94	0.17	2 / 0.5	Yes	422,386.50	43,698.40	6.0	
DPE-03	3/8/18 11:30	18.50	4.38	14.12	13.94	-0.18	2 / 0.5	Yes	462,533.70	40,147.20	6.0	
DPE-03	3/14/18 12:00	18.50	5.96	12.54	13.94	1.40	2 / 0.5	Yes	507,489.90	44,956.20	6.0	
DPE-03	5/8/18 13:00	18.50	5.25	13.25	13.94	0.69	2 / 0.5	Yes	512,509.50	5,019.60	6.0	
DPE-03	5/17/18 15:45	18.50	11.81	6.69	13.94	7.25	2 / 0.5	No	572,494.50	59,985.00	0.0	Off
DPE-03	5/23/18 15:30	18.50	12.80	5.70	13.94	8.24	2 / 0.5	No	572,494.50	0.00	0.0	Off
DPE-03	5/29/18 16:30	18.50	6.34	12.16	13.94	1.78	2 / 0.5	Yes	572,927.10	432.60	5.8	
DPE-03	6/7/18 13:15	18.50	6.38	12.12	13.94	1.82	2 / 0.5	Yes	601,165.20	28,238.10	5.6	
DPE-03	6/15/18 13:00	18.50	5.71	12.79	13.94	1.15	2 / 0.5	Yes	633,496.60	32,331.40	5.6	
DPE-03	6/18/18 12:20	18.50	4.79	13.71	13.94	0.23	#N/A	#N/A	#N/A	#N/A	#N/A	
DPE-03	7/5/18 12:00	18.50	12.68	5.82	13.94	8.12	2 / 0.5	No	674,566.60	41,070.00	0.0	Off
DPE-03	7/11/18 12:30	18.50	6.01	12.49	13.94	1.45	2 / 0.5	Yes	674,763.80	197.20	5.2	
DPE-03	7/19/18 14:30	18.50	5.57	12.93	13.94	1.01	2 / 0.5	Yes	679,873.70	5,109.90	5.2	
DPE-03	7/26/18 15:00	18.50	5.94	12.56	13.94	1.38	2 / 0.5	Yes	722,222.30	42,348.60	5.2	
DPE-03	8/3/18 15:10	18.50	11.31	7.19	13.94	6.75	2 / 0.5	No	753,213.80	30,991.50	0.0	Off
DPE-03	8/7/18 12:45	18.50	12.32	6.18	13.94	7.76	2 / 0.5	No	753,213.80	0.00	0.0	Off
DPE-03	8/15/18 14:00	18.50	12.49	6.01	13.94	7.93	2 / 0.5	No	753,213.80	0.00	0.0	Off
DPE-03	10/10/18 17:05	20.50	8.69	11.81	13.94	2.13	2 / 0.5	No	753,824.70	610.90	5.2	Recalibrated transducer depth after fall restart
DPE-03	10/18/18 14:15	20.50	7.15	13.35	13.94	0.59	2 / 0.5	No	758,998.70	5,174.00	5.4	
DPE-03	10/26/18 16:10	20.50	7.77	12.73	13.94	1.21	2 / 0.5	Yes	764,990.50	5,991.80	5.4	
DPE-03	11/7/18 16:10	20.50	6.23	14.27	13.94	-0.33	2 / 0.5	Yes	766,186.00	1,195.50	5.4	
DPE-03	11/13/18 13:20	20.50	6.71	13.79	13.94	0.15	2 / 0.5	Yes	798,687.10	32,501.10	5.4	
DPE-03	11/21/18 14:10	20.50	7.14	13.36	13.94	0.58	2 / 0.5	Yes	829,760.50	31,073.40	5.4	
DPE-03	1/11/19 10:30	20.50	13.73	6.77	13.94	7.17	2 / 0.5	No	847,310.60	17,550.10	0.0	Off

Table 4-4  
Dual-Phase Extraction Well Groundwater Operational Data  
Former Unocal Edmonds Bulk Fuel Terminal  
11720 Unoco Road  
Edmonds, Washington

DPE-04												
DPE Well ID	Date and Time	Transducer Depth	Water above Transducer (LT-4004)	Depth to Water <sup>2</sup>	Casing Elevation	Groundwater Elevation	Variable Frequency Drive Setting	Vacuum Applied	Extracted Groundwater Volume Totalizer <sup>3</sup>	Periodic Extracted Groundwater Volume	Instantaneous DPE Well Groundwater Flow Rate <sup>4</sup>	Comments
	mm/dd/yy hh:mm <sup>1</sup>	ft btoc	ft	ft btoc	ft NAVD88	ft NAVD88	High/Low	yes/no	gal	gal	gpm	
DPE-04	11/28/17 8:45	#N/A	#N/A	6.86	13.83	6.97	#N/A	#N/A	169.47	#N/A	#N/A	DPE System Baseline Event before System Startup - Pump off
DPE-04	12/5/17 11:35	18.50	2.00	16.50	13.83	-2.67	2 / 0.5	No	18,140	17,970.53	#N/A	Groundwater elevation estimated based on transducer setting
DPE-04	12/13/17 9:30	18.50	2.00	16.50	13.83	-2.67	2 / 0.5	Yes	34,380.70	16,240.70	2.8	
DPE-04	12/13/17 14:00	18.50	2.00	16.50	13.83	-2.67	2 / 0.5	Yes	35,198.70	818.00	2.8	
DPE-04	12/14/17 10:25	18.50	2.00	16.50	13.83	-2.67	2 / 0.5	Yes	38,377.90	3,179.20	2.6	
DPE-04	12/20/17 12:50	18.50	2.00	16.50	13.83	-2.67	2 / 0.5	Yes	50,755.30	12,377.40	3.0	
DPE-04	12/27/17 12:15	18.50	1.87	16.63	13.83	-2.80	2 / 0.5	Yes	66,641.50	15,886.20	2.8	
DPE-04	1/5/18 16:20	18.50	2.00	16.50	13.83	-2.67	2 / 0.5	Yes	81,882.00	15,240.50	3.0	
DPE-04	1/9/18 16:25	18.50	4.20	14.30	13.83	-0.47	4 / 0.5	Yes	83,508.90	1,626.90	2.4	
DPE-04	1/18/18 14:20	18.50	4.00	14.50	13.83	-0.67	4 / 0.5	Yes	93,863.00	10,354.10	2.6	
DPE-04	1/24/18 13:30	18.50	2.00	16.50	13.83	-2.67	2 / 0.5	Yes	107,424.70	13,561.70	2.4	
DPE-04	2/1/18 10:10	18.50	1.85	16.65	13.83	-2.82	2 / 0.5	Yes	132,923.90	25,499.20	2.8	
DPE-04	2/8/18 10:00	18.50	2.00	16.50	13.83	-2.67	2 / 0.5	Yes	147,384.70	14,460.80	3.0	
DPE-04	2/13/18 9:50	18.50	2.00	16.50	13.83	-2.67	2 / 0.5	No	166,068.90	18,684.20	2.8	
DPE-04	2/20/18 14:00	18.50	2.00	16.50	13.83	-2.67	2 / 0.5	Yes	182,342.10	16,273.20	3.2	
DPE-04	2/28/18 14:00	18.50	2.00	16.50	13.83	-2.67	2 / 0.5	Yes	202,601.10	20,259.00	3.0	
DPE-04	3/8/18 11:30	18.50	6.50	12.00	13.83	1.83	2 / 0.5	Yes	222,348.90	19,747.80	3.4	
DPE-04	3/14/18 12:00	18.50	2.00	16.50	13.83	-2.67	2 / 0.5	Yes	244,202.10	21,853.20	3.4	
DPE-04	5/8/18 13:00	18.50	2.00	16.50	13.83	-2.67	2 / 0.5	Yes	246,855.30	2,653.20	3.2	
DPE-04	5/17/18 15:45	18.50	10.37	8.13	13.83	5.70	2 / 0.5	No	277,200.10	30,344.80	0.0	Off
DPE-04	5/23/18 15:30	18.50	12.80	5.70	13.83	8.13	2 / 0.5	No	277,200.10	0.00	0.0	Off
DPE-04	5/29/18 16:30	18.50	1.64	16.86	13.83	-3.03	2 / 0.5	Yes	277,502.80	302.70	3.2	
DPE-04	6/7/18 13:15	18.50	2.00	16.50	13.83	-2.67	2 / 0.5	Yes	292,757.30	15,254.50	3.4	
DPE-04	6/15/18 13:00	18.50	2.00	16.50	13.83	-2.67	2 / 0.5	Yes	309,306.50	16,549.20	3.4	
DPE-04	6/18/18 12:20	18.50	2.00	16.50	13.83	-2.67	#N/A	#N/A	#N/A	#N/A	#N/A	
DPE-04	7/5/18 12:00	18.50	12.68	5.82	13.83	8.01	2 / 0.5	No	330,621.90	21,315.40	0.0	Off
DPE-04	7/11/18 12:30	18.50	2.00	16.50	13.83	-2.67	2 / 0.5	Yes	330,855.30	233.40	4.4	
DPE-04	7/19/18 14:30	18.50	6.21	12.29	13.83	1.54	2 / 0.5	Yes	334,010.40	3,155.10	4.2	
DPE-04	7/26/18 15:00	18.50	7.94	10.56	13.83	3.27	2 / 0.5	Yes	358,518.30	24,507.90	4.4	
DPE-04	8/3/18 15:10	18.50	11.01	7.49	13.83	6.34	2 / 0.5	No	376,685.60	18,167.30	0.0	Off
DPE-04	8/7/18 12:45	18.50	12.30	6.20	13.83	7.63	2 / 0.5	No	376,685.60	0.00	0.0	Off
DPE-04	8/15/18 14:00	18.50	12.45	6.05	13.83	7.78	2 / 0.5	No	376,685.60	0.00	0.0	Off
DPE-04	10/10/18 17:05	20.50	11.90	8.60	13.83	5.23	2 / 0.5	No	376,685.60	#N/A	--	Pump Faulted - Recalibrated transducer depth after fall restart
DPE-04	10/18/18 14:15	20.50	10.59	9.91	13.83	3.92	2 / 0.5	No	376,685.60	0.00	--	Pump Faulted
DPE-04	10/26/18 16:10	20.50	--	#N/A	13.83	#N/A	2 / 0.5	No	376,685.60	0.00	--	Pump Faulted
DPE-04	11/7/18 16:10	20.50	--	#N/A	13.83	#N/A	--	--	--	#N/A	--	Pump Faulted
DPE-04	11/13/18 13:20	20.50	--	#N/A	13.83	#N/A	--	--	--	#N/A	--	Pump Faulted
DPE-04	11/21/18 14:10	20.50	--	#N/A	13.83	#N/A	--	--	--	#N/A	--	Pump Faulted
DPE-04	1/11/19 10:30	20.50	--	#N/A	14.83	#N/A	--	--	--	#N/A	--	Pump Faulted

Table 4-4  
Dual-Phase Extraction Well Groundwater Operational Data  
Former Unocal Edmonds Bulk Fuel Terminal  
11720 Unoco Road  
Edmonds, Washington

DPE-05												
DPE Well ID	Date and Time	Transducer Depth	Water above Transducer (LT-4005)	Depth to Water <sup>2</sup>	Casing Elevation	Groundwater Elevation	Variable Frequency Drive Setting	Vacuum Applied	Extracted Groundwater Volume Totalizer <sup>3</sup>	Periodic Extracted Groundwater Volume	Instantaneous DPE Well Groundwater Flow Rate <sup>4</sup>	Comments
	mm/dd/yy hh:mm <sup>1</sup>	ft btoc	ft	ft btoc	ft NAVD88	ft NAVD88	High/Low	yes/no	gal	gal	gpm	
DPE-05	11/28/17 8:54	#N/A	#N/A	8.70	15.33	6.63	#N/A	#N/A	75.4	#N/A	#N/A	DPE System Baseline Event before System Startup - Pump off
DPE-05	12/5/17 11:35	20.50	2.00	18.50	15.33	-3.17	2 / 0.5	No	29,050	28,974.60	#N/A	Groundwater elevation estimated based on transducer setting
DPE-05	12/13/17 9:30	20.50	2.00	18.50	15.33	-3.17	2 / 0.5	Yes	56,713.90	27,663.90	4.6	
DPE-05	12/13/17 14:00	20.50	2.00	18.50	15.33	-3.17	2 / 0.5	Yes	58,055.30	1,341.40	2.8	
DPE-05	12/14/17 10:25	20.50	2.00	18.50	15.33	-3.17	2 / 0.5	Yes	63,645.40	5,590.10	2.6	
DPE-05	12/20/17 12:50	20.50	2.75	17.75	15.33	-2.42	2 / 0.5	Yes	85,058.60	21,413.20	5.4	
DPE-05	12/27/17 12:15	20.50	2.49	18.01	15.33	-2.68	2 / 0.5	Yes	114,374.50	29,315.90	5.6	
DPE-05	1/5/18 16:20	20.50	3.45	17.05	15.33	-1.72	2 / 0.5	Yes	142,837.10	28,462.60	5.2	
DPE-05	1/9/18 16:25	20.50	4.30	16.20	15.33	-0.87	4 / 0.5	Yes	145,988.90	3,151.80	5.4	
DPE-05	1/18/18 14:20	20.50	4.00	16.50	15.33	-1.17	4 / 0.5	Yes	168,499.80	22,510.90	5.4	
DPE-05	1/24/18 13:30	20.50	7.62	12.88	15.33	2.45	2 / 0.5	Yes	195,075.90	26,576.10	5.6	
DPE-05	2/1/18 10:10	20.50	2.50	18.00	15.33	-2.67	2 / 0.5	Yes	241,155.90	46,080.00	5.6	
DPE-05	2/8/18 10:00	20.50	2.00	18.50	15.33	-3.17	2 / 0.5	Yes	267,478.50	26,322.60	5.6	
DPE-05	2/13/18 9:50	20.50	2.00	18.50	15.33	-3.17	2 / 0.5	No	299,791.20	32,312.70	4.4	
DPE-05	2/20/18 14:00	20.50	2.00	18.50	15.33	-3.17	2 / 0.5	Yes	330,269.80	30,478.60	5.8	
DPE-05	2/28/18 14:00	20.50	2.00	18.50	15.33	-3.17	2 / 0.5	Yes	368,217.10	37,947.30	5.6	
DPE-05	3/8/18 11:30	20.50	8.44	12.06	15.33	3.27	2 / 0.5	Yes	402,569.20	34,352.10	5.6	
DPE-05	3/14/18 12:00	20.50	2.86	17.64	15.33	-2.31	2 / 0.5	Yes	438,196.00	35,626.80	5.6	
DPE-05	5/8/18 13:00	20.50	2.75	17.75	15.33	-2.42	2 / 0.5	Yes	442,345.20	4,149.20	3.4	
DPE-05	5/17/18 15:45	20.50	12.65	7.85	15.33	7.48	2 / 0.5	No	450,773.60	8,428.40	0.0	Off
DPE-05	5/23/18 15:30	20.50	13.21	7.29	15.33	8.04	2 / 0.5	No	450,773.60	0.00	0.0	Off
DPE-05	5/29/18 16:30	20.50	11.86	8.64	15.33	6.69	2 / 0.5	Yes	451,128.30	354.70	0.0	Off
DPE-05	6/7/18 13:15	20.50	6.62	13.88	15.33	1.45	2 / 0.5	Yes	451,128.70	0.40	5.8	
DPE-05	6/15/18 13:00	20.50	3.79	16.71	15.33	-1.38	2 / 0.5	Yes	479,007.70	27,879.00	5.4	
DPE-05	6/18/18 12:20	20.50	2.02	18.48	15.33	-3.15	#N/A	#N/A	#N/A	#N/A	#N/A	
DPE-05	7/5/18 12:00	20.50	13.03	7.47	15.33	7.86	2 / 0.5	No	517,157.90	38,150.20	0.0	Off
DPE-05	7/11/18 12:30	20.50	12.15	8.35	15.33	6.98	2 / 0.5	No	517,157.90	0.00	0.0	Off
DPE-05	7/19/18 14:30	20.50	12.00	8.50	15.33	6.83	2 / 0.5	No	517,157.90	0.00	0.0	Off
DPE-05	7/26/18 15:00	20.50	12.34	8.16	15.33	7.17	2 / 0.5	No	517,157.90	0.00	0.0	Off
DPE-05	8/3/18 15:10	20.50	12.55	7.95	15.33	7.38	2 / 0.5	No	517,157.90	0.00	0.0	Off
DPE-05	8/7/18 12:45	20.50	12.80	7.70	15.33	7.63	2 / 0.5	No	517,157.90	0.00	0.0	Off
DPE-05	8/15/18 14:00	20.50	13.04	7.46	15.33	7.87	2 / 0.5	No	517,157.90	0.00	0.0	Off
DPE-05	10/10/18 17:05	23.00	10.66	12.34	15.33	2.99	2 / 0.5	No	517,466.90	309.00	5.8	Recalibrated transducer depth after fall restart
DPE-05	10/18/18 14:15	23.00	4.21	18.79	15.33	-3.46	2 / 0.5	Yes	522,285.50	4,818.60	5.4	
DPE-05	10/26/18 16:10	23.00	4.66	18.34	15.33	-3.01	2 / 0.5	Yes	528,205.00	5,919.50	5.4	
DPE-05	11/7/18 16:10	23.00	4.51	18.49	15.33	-3.16	2 / 0.5	Yes	529,369.10	1,164.10	5.2	
DPE-05	11/13/18 13:20	23.00	3.52	19.48	15.33	-4.15	2 / 0.5	Yes	561,090.90	31,721.80	3.2	
DPE-05	11/21/18 14:10	23.00	4.21	18.79	15.33	-3.46	2 / 0.5	Yes	591,292.60	30,201.70	5.0	
DPE-05	1/11/19 10:30	23.00	14.22	8.78	15.33	6.55	2 / 0.5	No	608,527.90	17,235.30	0.0	Off

Table 4-4  
Dual-Phase Extraction Well Groundwater Operational Data  
Former Unocal Edmonds Bulk Fuel Terminal  
11720 Unoco Road  
Edmonds, Washington

DPE-06												
DPE Well ID	Date and Time	Transducer Depth	Water above Transducer (LT-4006)	Depth to Water <sup>2</sup>	Casing Elevation	Groundwater Elevation	Variable Frequency Drive Setting	Vacuum Applied	Extracted Groundwater Volume Totalizer <sup>3</sup>	Periodic Extracted Groundwater Volume	Instantaneous DPE Well Groundwater Flow Rate <sup>4</sup>	Comments
	mm/dd/yy hh:mm <sup>1</sup>	ft btoc	ft	ft btoc	ft NAVD88	ft NAVD88	High/Low	yes/no	gal	gal	gpm	
DPE-06	11/28/17 8:52	#N/A	#N/A	8.34	15.34	7.00	#N/A	#N/A	78.36	#N/A	#N/A	DPE System Baseline Event before System Startup - Pump off
DPE-06	12/5/17 11:35	20.50	2.00	18.50	15.34	-3.16	2 / 0.5	No	408.85	330.49	#N/A	Groundwater elevation estimated based on transducer setting
DPE-06	12/13/17 9:30	20.50	0.80	19.70	15.34	-4.36	2 / 0.5	Yes	762.60	353.75	0.0	Low yield
DPE-06	12/13/17 14:00	20.50	1.00	19.50	15.34	-4.16	2 / 0.5	Yes	894.90	132.30	0.0	Low yield
DPE-06	12/14/17 10:25	20.50	0.70	19.80	15.34	-4.46	2 / 0.5	Yes	982.90	88.00	0.0	Low yield
DPE-06	12/20/17 12:50	20.50	0.85	19.65	15.34	-4.31	2 / 0.5	Yes	1,200.10	217.20	0.0	Low yield
DPE-06	12/27/17 12:15	20.50	0.94	19.56	15.34	-4.22	2 / 0.5	Yes	1,696.30	496.20	0.0	Low yield
DPE-06	1/5/18 16:20	20.50	0.80	19.70	15.34	-4.36	2 / 0.5	Yes	2,090.10	393.80	0.0	Low yield
DPE-06	1/9/18 16:25	20.50	1.00	19.50	15.34	-4.16	4 / 0.5	Yes	2,179.90	89.80	0.0	Low yield
DPE-06	1/18/18 14:20	20.50	0.94	19.56	15.34	-4.22	4 / 0.5	Yes	2,580.10	400.20	0.0	Low yield
DPE-06	1/24/18 13:30	20.50	0.00	20.50	15.34	-5.16	2 / 0.5	Yes	2,612.20	32.10	0.0	Low yield
DPE-06	2/1/18 10:10	20.50	1.23	19.27	15.34	-3.93	2 / 0.5	Yes	3,360.90	748.70	0.0	Low yield
DPE-06	2/8/18 10:00	20.50	9.20	11.30	15.34	4.04	2 / 0.5	Yes	3,649.40	288.50	0.0	Low yield
DPE-06	2/13/18 9:50	20.50	1.35	19.15	15.34	-3.81	2 / 0.5	No	4,110.10	460.70	0.0	Low yield
DPE-06	2/20/18 14:00	20.50	0.74	19.76	15.34	-4.42	2 / 0.5	Yes	4,510.00	399.90	0.0	Low yield
DPE-06	2/28/18 14:00	20.50	0.00	20.50	15.34	-5.16	2 / 0.5	Yes	5,156.50	646.50	0.0	Low yield
DPE-06	3/8/18 11:30	20.50	0.00	20.50	15.34	-5.16	2 / 0.5	Yes	5,747.10	590.60	0.0	Low yield
DPE-06	3/14/18 12:00	20.50	0.00	20.50	15.34	-5.16	2 / 0.5	Yes	6,439.50	692.40	0.0	Low yield
DPE-06	5/8/18 13:00	20.50	0.50	20.00	15.34	-4.66	2 / 0.5	Yes	6,559.00	119.50	0.0	Low yield
DPE-06	5/17/18 15:45	20.50	6.74	13.76	15.34	1.58	2 / 0.5	No	7,502.10	943.10	0.0	Off
DPE-06	5/23/18 15:30	20.50	10.88	9.62	15.34	5.72	2 / 0.5	No	7,502.10	0.00	0.0	Off
DPE-06	5/29/18 16:30	20.50	0.53	19.97	15.34	-4.63	2 / 0.5	Yes	7,605.50	103.40	0.0	
DPE-06	6/7/18 13:15	20.50	0.46	20.04	15.34	-4.70	2 / 0.5	Yes	8,129.30	523.80	0.0	
DPE-06	6/15/18 13:00	20.50	0.84	19.66	15.34	-4.32	2 / 0.5	Yes	8,562.00	432.70	0.0	
DPE-06	6/18/18 12:20	20.50	1.00	19.50	15.34	-4.16	#N/A	#N/A	#N/A	#N/A	#N/A	
DPE-06	7/5/18 12:00	20.50	10.69	9.81	15.34	5.53	2 / 0.5	No	9,005.80	443.80	0.0	Off
DPE-06	7/11/18 12:30	20.50	4.71	15.79	15.34	-0.45	2 / 0.5	No	9,005.80	0.00	0.0	Off
DPE-06	7/19/18 14:30	20.50	10.00	10.50	15.34	4.84	2 / 0.5	No	9,005.80	0.00	0.0	Off
DPE-06	7/26/18 15:00	20.50	10.14	10.36	15.34	4.98	2 / 0.5	No	9,005.80	0.00	0.0	Off
DPE-06	8/3/18 15:10	20.50	10.26	10.24	15.34	5.10	2 / 0.5	No	9,005.80	0.00	0.0	Off
DPE-06	8/7/18 12:45	20.50	10.29	10.21	15.34	5.13	2 / 0.5	No	9,005.80	0.00	0.0	Off
DPE-06	8/15/18 14:00	20.50	10.53	9.97	15.34	5.37	2 / 0.5	No	9,005.80	0.00	0.0	Off
DPE-06	10/10/18 17:05	20.50	0.36	20.14	15.34	-4.80	2 / 0.5	No	9,150.60	144.80	0.0	Recalibrated transducer depth after fall restart
DPE-06	10/18/18 14:15	20.50	1.02	19.48	15.34	-4.14	2 / 0.5	Yes	9,240.80	90.20	0.0	
DPE-06	10/26/18 16:10	20.50	0.76	19.74	15.34	-4.40	2 / 0.5	Yes	9,262.60	21.80	0.0	
DPE-06	11/7/18 16:10	20.50	0.04	20.46	15.34	-5.12	2 / 0.5	Yes	9,381.50	118.90	0.0	
DPE-06	11/13/18 13:20	20.50	0.88	19.62	15.34	-4.28	2 / 0.5	Yes	9,917.20	535.70	0.0	
DPE-06	11/21/18 14:10	20.50	1.29	19.21	15.34	-3.87	2 / 0.5	Yes	10,246.10	328.90	0.0	
DPE-06	1/11/19 10:30	20.50	14.01	6.49	15.34	8.85	2 / 0.5	No	10,504.70	258.60	0.0	Off

Table 4-4  
Dual-Phase Extraction Well Groundwater Operational Data  
Former Unocal Edmonds Bulk Fuel Terminal  
11720 Unoco Road  
Edmonds, Washington

DPE-07												
DPE Well ID	Date and Time	Transducer Depth	Water above Transducer (LT-4007)	Depth to Water <sup>2</sup>	Casing Elevation	Groundwater Elevation	Variable Frequency Drive Setting	Vacuum Applied	Extracted Groundwater Volume Totalizer <sup>3</sup>	Periodic Extracted Groundwater Volume	Instantaneous DPE Well Groundwater Flow Rate <sup>4</sup>	Comments
	mm/dd/yy hh:mm <sup>1</sup>	ft btoc	ft	ft btoc	ft NAVD88	ft NAVD88	High/Low	yes/no	gal	gal	gpm	
DPE-07	11/28/17 9:29	#N/A	#N/A	6.43	13.68	7.25	#N/A	#N/A	100.3	#N/A	#N/A	DPE System Baseline Event before System Startup - Pump off
DPE-07	12/5/17 11:35	20.50	2.00	18.50	13.68	-4.82	2 / 0.5	No	2,993	2,892.70	#N/A	Groundwater elevation estimated based on transducer setting
DPE-07	12/13/17 9:30	20.50	1.25	19.25	13.68	-5.57	2 / 0.5	Yes	5,998.80	3,005.80	0.0	Low yield
DPE-07	12/13/17 14:00	20.50	1.00	19.50	13.68	-5.82	2 / 0.5	Yes	6,273.70	274.90	0.8	Low yield
DPE-07	12/14/17 10:25	20.50	3.00	17.50	13.68	-3.82	2 / 0.5	Yes	7,090.40	816.70	0.0	Low yield
DPE-07	12/20/17 12:50	20.50	2.00	18.50	13.68	-4.82	2 / 0.5	Yes	10,908.20	3,817.80	1.4	
DPE-07	12/27/17 12:15	20.50	2.00	18.50	13.68	-4.82	2 / 0.5	Yes	17,689.50	6,781.30	1.8	
DPE-07	1/5/18 16:20	20.50	2.00	18.50	13.68	-4.82	2 / 0.5	Yes	25,494.70	7,805.20	1.6	
DPE-07	1/9/18 16:25	20.50	4.00	16.50	13.68	-2.82	4 / 0.5	Yes	26,513.10	1,018.40	1.6	
DPE-07	1/18/18 14:20	20.50	4.00	16.50	13.68	-2.82	4 / 0.5	Yes	33,531.90	7,018.80	1.6	
DPE-07	1/24/18 13:30	20.50	2.00	18.50	13.68	-4.82	2 / 0.5	Yes	42,292.30	8,760.40	1.8	
DPE-07	2/1/18 10:10	20.50	1.20	19.30	13.68	-5.62	2 / 0.5	Yes	55,889.50	13,597.20	2.0	
DPE-07	2/8/18 10:00	20.50	2.00	18.50	13.68	-4.82	2 / 0.5	Yes	64,190.20	8,300.70	2.0	
DPE-07	2/13/18 9:50	20.50	2.00	18.50	13.68	-4.82	2 / 0.5	No	76,498.10	12,307.90	1.8	
DPE-07	2/20/18 14:00	20.50	2.00	18.50	13.68	-4.82	2 / 0.5	Yes	89,139.90	12,641.80	2.2	
DPE-07	2/28/18 14:00	20.50	2.00	18.50	13.68	-4.82	2 / 0.5	Yes	103,978.40	14,838.50	2.0	
DPE-07	3/8/18 11:30	20.50	7.42	13.08	13.68	0.60	2 / 0.5	No	111,905.90	7,927.50	0.0	Off
DPE-07	3/14/18 12:00	20.50	6.03	14.47	13.68	-0.79	2 / 0.5	No	111,905.90	0.00	0.0	Off
DPE-07	5/8/18 13:00	20.50	2.00	18.50	13.68	-4.82	2 / 0.5	Yes	112,217.50	311.60	2.2	
DPE-07	5/17/18 15:45	20.50	13.25	7.25	13.68	6.43	2 / 0.5	No	134,321.30	22,103.80	0.0	Off
DPE-07	5/23/18 15:30	20.50	14.63	5.87	13.68	7.81	2 / 0.5	No	134,321.30	0.00	0.0	Off
DPE-07	5/29/18 16:30	20.50	2.00	18.50	13.68	-4.82	2 / 0.5	Yes	134,483.70	162.40	2.0	
DPE-07	6/7/18 13:15	20.50	2.13	18.37	13.68	-4.69	2 / 0.5	Yes	145,336.00	10,852.30	2.2	
DPE-07	6/15/18 13:00	20.50	2.00	18.50	13.68	-4.82	2 / 0.5	Yes	157,289.50	11,953.50	2.4	
DPE-07	6/18/18 12:20	20.50	2.00	18.50	13.68	-4.82	#N/A	#N/A	#N/A	#N/A	#N/A	
DPE-07	7/5/18 12:00	20.50	14.53	5.97	13.68	7.71	2 / 0.5	No	173,670.60	16,381.10	0.0	Off
DPE-07	7/11/18 12:30	20.50	12.51	7.99	13.68	5.69	2 / 0.5	No	173,670.60	0.00	0.0	Off
DPE-07	7/19/18 14:30	20.50	12.97	7.53	13.68	6.15	2 / 0.5	No	173,670.60	0.00	0.0	Off
DPE-07	7/26/18 15:00	20.50	12.30	8.20	13.68	5.48	2 / 0.5	No	173,670.60	0.00	0.0	Off
DPE-07	8/3/18 15:10	20.50	13.22	7.28	13.68	6.40	2 / 0.5	No	173,670.60	0.00	0.0	Off
DPE-07	8/7/18 12:45	20.50	13.81	6.69	13.68	6.99	2 / 0.5	No	173,670.60	0.00	0.0	Off
DPE-07	8/15/18 14:00	20.50	14.27	6.23	13.68	7.45	2 / 0.5	No	173,670.60	0.00	0.0	Off
DPE-07	10/10/18 17:05	22.50	2.00	20.50	13.68	-6.82	2 / 0.5	No	174,036.00	365.40	2.6	Recalibrated transducer depth after fall restart
DPE-07	10/18/18 14:15	22.50	2.00	20.50	13.68	-6.82	2 / 0.5	Yes	176,227.10	2,191.10	3.2	
DPE-07	10/26/18 16:10	22.50	2.00	20.50	13.68	-6.82	2 / 0.5	Yes	179,061.20	2,834.10	3.0	
DPE-07	11/7/18 16:10	22.50	2.00	20.50	13.68	-6.82	2 / 0.5	Yes	179,648.10	586.90	2.8	
DPE-07	11/13/18 13:20	22.50	2.00	20.50	13.68	-6.82	2 / 0.5	Yes	193,753.20	14,105.10	2.4	
DPE-07	11/21/18 14:10	22.50	2.00	20.50	13.68	-6.82	2 / 0.5	Yes	206,006.50	12,253.30	3.0	
DPE-07	1/11/19 10:30	22.50	16.20	6.30	13.68	7.38	2 / 0.5	No	213,404.20	7,397.70	0.0	Off

Table 4-4  
Dual-Phase Extraction Well Groundwater Operational Data  
Former Unocal Edmonds Bulk Fuel Terminal  
11720 Unoco Road  
Edmonds, Washington

DPE-08												
DPE Well ID	Date and Time	Transducer Depth	Water above Transducer (LT-4008)	Depth to Water <sup>2</sup>	Casing Elevation	Groundwater Elevation	Variable Frequency Drive Setting	Vacuum Applied	Extracted Groundwater Volume Totalizer <sup>3</sup>	Periodic Extracted Groundwater Volume	Instantaneous DPE Well Groundwater Flow Rate <sup>4</sup>	Comments
	mm/dd/yy hh:mm <sup>1</sup>	ft btoc	ft	ft btoc	ft NAVD88	ft NAVD88	High/Low	yes/no	gal	gal	gpm	
DPE-08	11/28/17 9:33	#N/A	#N/A	7.40	14.86	7.46	#N/A	#N/A	70.46	#N/A	#N/A	DPE System Baseline Event before System Startup - Pump off
DPE-08	12/5/17 11:35	20.50	2.00	18.50	14.86	-3.64	2 / 0.5	No	33,192	33,121.54	#N/A	Groundwater elevation estimated based on transducer setting
DPE-08	12/13/17 9:30	20.50	7.15	13.35	14.86	1.51	2 / 0.5	No	65,746.00	32,554.00	5.4	
DPE-08	12/13/17 14:00	20.50	8.10	12.40	14.86	2.46	2 / 0.5	No	67,197.50	1,451.50	5.2	
DPE-08	12/14/17 10:25	20.50	6.55	13.95	14.86	0.91	2 / 0.5	No	73,420.00	6,222.50	5.2	
DPE-08	12/20/17 12:50	20.50	8.44	12.06	14.86	2.80	2 / 0.5	No	97,600.40	24,180.40	5.2	
DPE-08	12/27/17 12:15	20.50	8.86	11.64	14.86	3.22	2 / 0.5	No	127,947.40	30,347.00	5.4	
DPE-08	1/5/18 16:20	20.50	8.41	12.09	14.86	2.77	2 / 0.5	No	158,250.20	30,302.80	5.2	
DPE-08	1/9/18 16:25	20.50	8.30	12.20	14.86	2.66	4 / 0.5	No	161,726.30	3,476.10	5.2	
DPE-08	1/18/18 14:20	20.50	13.97	6.53	14.86	8.33	4 / 0.5	No	171,398.50	9,672.20	0.0	Off
DPE-08	1/24/18 13:30	20.50	8.93	11.57	14.86	3.29	2 / 0.5	No	175,178.90	3,780.40	5.4	
DPE-08	2/1/18 10:10	20.50	8.56	11.94	14.86	2.92	2 / 0.5	No	219,657.90	44,479.00	5.2	
DPE-08	2/8/18 10:00	20.50	14.00	6.50	14.86	8.36	2 / 0.5	No	231,354.60	11,696.70	0.0	Off
DPE-08	2/13/18 9:50	20.50	13.42	7.08	14.86	7.78	2 / 0.5	No	231,354.60	0.00	0.0	Off
DPE-08	2/20/18 14:00	20.50	12.49	8.01	14.86	6.85	2 / 0.5	No	231,354.60	0.00	0.0	Off
DPE-08	2/28/18 14:00	20.50	8.45	12.05	14.86	2.81	2 / 0.5	Yes	263,150.50	31,795.90	5.2	
DPE-08	3/8/18 11:30	20.50	12.50	8.00	14.86	6.86	2 / 0.5	No	284,910.20	21,759.70	0.0	Off
DPE-08	3/14/18 12:00	20.50	13.38	7.12	14.86	7.74	2 / 0.5	No	284,910.20	0.00	0.0	Off
DPE-08	5/8/18 13:00	20.50	10.00	10.50	14.86	4.36	2 / 0.5	Yes	286,585.50	1,675.30	5.6	
DPE-08	5/17/18 15:45	20.50	12.10	8.40	14.86	6.46	2 / 0.5	No	293,374.10	6,788.60	0.0	Off
DPE-08	5/23/18 15:30	20.50	13.74	6.76	14.86	8.10	2 / 0.5	No	293,374.10	0.00	0.0	Off
DPE-08	5/29/18 16:30	20.50	11.95	8.55	14.86	6.31	2 / 0.5	No	293,691.30	317.20	0.0	Off
DPE-08	6/7/18 13:15	20.50	13.13	7.37	14.86	7.49	2 / 0.5	No	293,691.30	0.00	0.0	Off
DPE-08	6/15/18 13:00	20.50	13.10	7.40	14.86	7.46	2 / 0.5	No	293,691.30	0.00	0.0	Off
DPE-08	6/18/18 12:20	20.50	13.23	7.28	14.86	7.59	#N/A	#N/A	#N/A	#N/A	#N/A	
DPE-08	7/5/18 12:00	20.50	13.55	6.95	14.86	7.91	2 / 0.5	No	293,691.40	0.10	0.0	Off
DPE-08	7/11/18 12:30	20.50	12.22	8.28	14.86	6.58	2 / 0.5	No	293,691.40	0.00	0.0	Off
DPE-08	7/19/18 14:30	20.50	12.97	7.53	14.86	7.33	2 / 0.5	No	293,691.40	0.00	0.0	Off
DPE-08	7/26/18 15:00	20.50	11.81	8.69	14.86	6.17	2 / 0.5	No	293,691.40	0.00	0.0	Off
DPE-08	8/3/18 15:10	20.50	12.41	8.09	14.86	6.77	2 / 0.5	No	293,691.40	0.00	0.0	Off
DPE-08	8/7/18 12:45	20.50	12.52	7.98	14.86	6.88	2 / 0.5	No	293,691.40	0.00	0.0	Off
DPE-08	8/15/18 14:00	20.50	13.14	7.36	14.86	7.50	2 / 0.5	No	293,691.40	0.00	0.0	Off
DPE-08	10/10/18 17:05	22.50	11.00	11.50	14.86	3.36	2 / 0.5	No	294,385.20	693.80	0.0	Off - Recalibrated transducer depth after fall restart
DPE-08	10/18/18 14:15	22.50	13.88	8.62	14.86	6.24	2 / 0.5	No	294,385.20	0.00	0.0	Off
DPE-08	10/26/18 16:10	22.50	13.72	8.78	14.86	6.08	2 / 0.5	No	294,543.70	158.50	0.0	Off
DPE-08	11/7/18 16:10	22.50	14.01	8.49	14.86	6.37	2 / 0.5	No	294,543.70	0.00	0.0	Off
DPE-08	11/13/18 13:20	22.50	11.00	11.50	14.86	3.36	2 / 0.5	Yes	294,882.50	338.80	5.4	
DPE-08	11/21/18 14:10	22.50	14.22	8.28	14.86	6.58	2 / 0.5	No	296,081.40	1,198.90	0.0	Off
DPE-08	1/11/19 10:30	22.50	15.59	6.91	14.86	7.95	2 / 0.5	No	296,986.60	905.20	0.0	Off

Table 4-4  
Dual-Phase Extraction Well Groundwater Operational Data  
Former Unocal Edmonds Bulk Fuel Terminal  
11720 Unoco Road  
Edmonds, Washington

DPE-09												
DPE Well ID	Date and Time	Transducer Depth	Water above Transducer (LT-4009)	Depth to Water <sup>2</sup>	Casing Elevation	Groundwater Elevation	Variable Frequency Drive Setting	Vacuum Applied	Extracted Groundwater Volume Totalizer <sup>3</sup>	Periodic Extracted Groundwater Volume	Instantaneous DPE Well Groundwater Flow Rate <sup>4</sup>	Comments
	mm/dd/yy hh:mm <sup>1</sup>	ft btoc	ft	ft btoc	ft NAVD88	ft NAVD88	High/Low	yes/no	gal	gal	gpm	
DPE-09	11/28/17 9:41	#N/A	#N/A	6.61	14.32	7.71	#N/A	#N/A	36.47	#N/A	#N/A	DPE System Baseline Event before System Startup - Pump off
DPE-09	12/5/17 11:35	20.50	10.00	10.50	14.32	3.82	10/0.5	No	34,166	34,129.53	#N/A	Groundwater elevation estimated based on transducer setting
DPE-09	12/13/17 9:30	20.50	9.50	11.00	14.32	3.32	2 / 0.5	No	68,091.90	33,925.90	5.4	
DPE-09	12/13/17 14:00	20.50	9.85	10.65	14.32	3.67	2 / 0.5	No	69,584.60	1,492.70	5.6	
DPE-09	12/14/17 10:25	20.50	9.00	11.50	14.32	2.82	2 / 0.5	No	76,168.70	6,584.10	5.4	
DPE-09	12/20/17 12:50	20.50	10.35	10.15	14.32	4.17	2 / 0.5	No	101,590.60	25,421.90	5.6	
DPE-09	12/27/17 12:15	20.50	10.49	10.01	14.32	4.31	2 / 0.5	No	133,072.90	31,482.30	5.4	
DPE-09	1/5/18 16:20	20.50	10.40	10.10	14.32	4.22	2 / 0.5	No	164,575.90	31,503.00	5.6	
DPE-09	1/9/18 16:25	20.50	10.75	9.75	14.32	4.57	4 / 0.5	No	167,640.10	3,064.20	5.4	
DPE-09	1/18/18 14:20	20.50	14.10	6.40	14.32	7.92	4 / 0.5	No	178,087.80	10,447.70	0.0	Off
DPE-09	1/24/18 13:30	20.50	11.23	9.27	14.32	5.05	2 / 0.5	No	182,004.80	3,917.00	5.4	
DPE-09	2/1/18 10:10	20.50	10.00	10.50	14.32	3.82	2 / 0.5	No	228,383.70	46,378.90	5.6	
DPE-09	2/8/18 10:00	20.50	14.33	6.17	14.32	8.15	2 / 0.5	No	240,595.30	12,211.60	0.0	Off
DPE-09	2/13/18 9:50	20.50	14.04	6.46	14.32	7.86	2 / 0.5	No	240,595.30	0.00	0.0	Off
DPE-09	2/20/18 14:00	20.50	13.55	6.95	14.32	7.37	2 / 0.5	No	240,595.30	0.00	0.0	Off
DPE-09	2/28/18 14:00	20.50	10.04	10.46	14.32	3.86	2 / 0.5	No	273,687.60	33,092.30	5.6	
DPE-09	3/8/18 11:30	20.50	14.10	6.40	14.32	7.92	2 / 0.5	No	295,658.80	21,971.20	0.0	Off
DPE-09	3/14/18 12:00	20.50	14.09	6.41	14.32	7.91	2 / 0.5	No	295,658.80	0.00	0.0	Off
DPE-09	5/8/18 13:00	20.50	11.10	9.40	14.32	4.92	2 / 0.5	Yes	296,215.00	556.20	5.6	
DPE-09	5/17/18 15:45	20.50	12.96	7.54	14.32	6.78	2 / 0.5	No	305,403.30	9,188.30	0.0	Off
DPE-09	5/23/18 15:30	20.50	13.50	7.00	14.32	7.32	2 / 0.5	No	305,403.30	0.00	0.0	Off
DPE-09	5/29/18 16:30	20.50	12.60	7.90	14.32	6.42	2 / 0.5	No	305,714.40	311.10	0.0	Off
DPE-09	6/7/18 13:15	20.50	13.57	6.93	14.32	7.39	2 / 0.5	No	305,714.40	0.00	0.0	Off
DPE-09	6/15/18 13:00	20.50	13.70	6.80	14.32	7.52	2 / 0.5	No	305,714.40	0.00	0.0	Off
DPE-09	6/18/18 12:20	20.50	13.50	7.01	14.32	7.32	#N/A	#N/A	#N/A	#N/A	#N/A	
DPE-09	7/5/18 12:00	20.50	13.77	6.73	14.32	7.59	2 / 0.5	No	305,715.40	1.00	0.0	Off
DPE-09	7/11/18 12:30	20.50	13.00	7.50	14.32	6.82	2 / 0.5	No	305,715.40	0.00	0.0	Off
DPE-09	7/19/18 14:30	20.50	13.60	6.90	14.32	7.42	2 / 0.5	No	305,715.40	0.00	0.0	Off
DPE-09	7/26/18 15:00	20.50	12.85	7.65	14.32	6.67	2 / 0.5	No	305,715.40	0.00	0.0	Off
DPE-09	8/3/18 15:10	20.50	13.06	7.44	14.32	6.88	2 / 0.5	No	305,715.40	0.00	0.0	Off
DPE-09	8/7/18 12:45	20.50	12.94	7.56	14.32	6.76	2 / 0.5	No	305,715.40	0.00	0.0	Off
DPE-09	8/15/18 14:00	20.50	13.40	7.10	14.32	7.22	2 / 0.5	No	305,715.40	0.00	0.0	Off
DPE-09	10/10/18 17:05	22.00	12.26	9.74	14.32	4.58	2 / 0.5	No	306,335.80	620.40	0.0	Off - Recalibrated transducer depth after fall restart
DPE-09	10/18/18 14:15	22.00	14.11	7.89	14.32	6.43	2 / 0.5	No	306,335.80	0.00	0.0	Off
DPE-09	10/26/18 16:10	22.00	13.97	8.03	14.32	6.29	2 / 0.5	No	306,599.90	264.10	0.0	Off
DPE-09	11/7/18 16:10	22.00	14.36	7.64	14.32	6.68	2 / 0.5	No	306,599.90	0.00	0.0	Off
DPE-09	11/13/18 13:20	22.00	11.65	10.35	14.32	3.97	2 / 0.5	Yes	306,953.40	353.50	5.6	
DPE-09	11/21/18 14:10	22.00	14.22	7.78	14.32	6.54	2 / 0.5	No	308,190.40	1,237.00	0.0	Off
DPE-09	1/11/19 10:30	22.00	16.07	5.93	14.32	8.39	2 / 0.5	No	308,192.50	2.10	0.0	Off

Table 4-4  
Dual-Phase Extraction Well Groundwater Operational Data  
Former Unocal Edmonds Bulk Fuel Terminal  
11720 Unoco Road  
Edmonds, Washington

DPE-10												
DPE Well ID	Date and Time	Transducer Depth	Water above Transducer (LT-4010)	Depth to Water <sup>2</sup>	Casing Elevation	Groundwater Elevation	Variable Frequency Drive Setting	Vacuum Applied	Extracted Groundwater Volume Totalizer <sup>3</sup>	Periodic Extracted Groundwater Volume	Instantaneous DPE Well Groundwater Flow Rate <sup>4</sup>	Comments
	mm/dd/yy hh:mm <sup>1</sup>	ft btoc	ft	ft btoc	ft NAVD88	ft NAVD88	High/Low	yes/no	gal	gal	gpm	
DPE-10	11/28/17 9:52	#N/A	#N/A	6.43	14.34	7.91	#N/A	#N/A	79.72	#N/A	#N/A	DPE System Baseline Event before System Startup - Pump off
DPE-10	12/5/17 11:35	20.50	10.00	10.50	14.34	3.84	10 / 0.5	No	24,846	24,766.28	#N/A	Groundwater elevation estimated based on transducer setting
DPE-10	12/13/17 9:30	20.50	7.01	13.49	14.34	0.85	2 / 0.5	Yes	47,568.50	22,722.50	5.4	
DPE-10	12/13/17 14:00	20.50	7.00	13.50	14.34	0.84	2 / 0.5	Yes	48,953.60	1,385.10	5.4	
DPE-10	12/14/17 10:25	20.50	6.30	14.20	14.34	0.14	2 / 0.5	Yes	55,482.20	6,528.60	5.2	
DPE-10	12/20/17 12:50	20.50	8.25	12.25	14.34	2.09	2 / 0.5	Yes	79,541.00	24,058.80	5.4	
DPE-10	12/27/17 12:15	20.50	9.13	11.37	14.34	2.97	2 / 0.5	Yes	109,546.50	30,005.50	5.0	
DPE-10	1/5/18 16:20	20.50	10.00	10.50	14.34	3.84	2 / 0.5	Yes	138,951.20	29,404.70	5.4	
DPE-10	1/9/18 16:25	20.50	11.05	9.45	14.34	4.89	4 / 0.5	Yes	141,848.60	2,897.40	5.2	
DPE-10	1/18/18 14:20	20.50	11.73	8.77	14.34	5.57	4 / 0.5	Yes	164,269.30	22,420.70	5.0	
DPE-10	1/24/18 13:30	20.50	11.68	8.82	14.34	5.52	2 / 0.5	Yes	191,510.30	27,241.00	5.2	
DPE-10	2/1/18 10:10	20.50	10.45	10.05	14.34	4.29	2 / 0.5	Yes	235,558.60	44,048.30	5.4	
DPE-10	2/8/18 10:00	20.50	15.14	5.36	14.34	8.98	2 / 0.5	No	247,338.00	11,779.40	0.0	Off
DPE-10	2/13/18 9:50	20.50	15.08	5.42	14.34	8.92	2 / 0.5	No	247,338.00	0.00	0.0	Off
DPE-10	2/20/18 14:00	20.50	14.92	5.58	14.34	8.76	2 / 0.5	No	261,923.90	14,585.90	0.0	Off
DPE-10	2/28/18 14:00	20.50	14.05	6.45	14.34	7.89	2 / 0.5	No	261,937.40	13.50	0.0	Off
DPE-10	3/8/18 11:30	20.50	15.00	5.50	14.34	8.84	2 / 0.5	No	261,937.40	0.00	0.0	Off
DPE-10	3/14/18 12:00	20.50	15.22	5.28	14.34	9.06	2 / 0.5	No	261,937.40	0.00	0.0	Off
DPE-10	5/8/18 13:00	20.50	11.68	8.82	14.34	5.52	2 / 0.5	Yes	262,424.50	487.10	5.8	
DPE-10	5/17/18 15:45	20.50	14.25	6.25	14.34	8.09	2 / 0.5	No	272,097.50	9,673.00	0.0	Off
DPE-10	5/23/18 15:30	20.50	14.48	6.02	14.34	8.32	2 / 0.5	No	272,097.50	0.00	0.0	Off
DPE-10	5/29/18 16:30	20.50	14.04	6.46	14.34	7.88	2 / 0.5	No	272,421.00	323.50	0.0	Off
DPE-10	6/7/18 13:15	20.50	14.56	5.94	14.34	8.40	2 / 0.5	No	272,421.00	0.00	0.0	Off
DPE-10	6/15/18 13:00	20.50	14.71	5.79	14.34	8.55	2 / 0.5	No	272,421.00	0.00	0.0	Off
DPE-10	6/18/18 12:20	20.50	14.29	6.21	14.34	8.13	#N/A	#N/A	#N/A	#N/A	#N/A	
DPE-10	7/5/18 12:00	-	#N/A	#N/A	14.34	#N/A	2 / 0.5	No	272,421.00	0.00	0.0	Off - Transducer off
DPE-10	7/11/18 12:00	-	#N/A	#N/A	14.34	#N/A	2 / 0.5	No	272,421.00	0.00	0.0	Off
DPE-10	7/19/18 14:30	-	#N/A	#N/A	14.34	#N/A	2 / 0.5	No	272,421.00	0.00	0.0	Off
DPE-10	7/26/18 15:00	-	#N/A	#N/A	14.34	#N/A	2 / 0.5	No	272,421.00	0.00	0.0	Off
DPE-10	8/3/18 15:10	-	#N/A	#N/A	14.34	#N/A	2 / 0.5	No	272,421.00	0.00	0.0	Off
DPE-10	8/7/18 12:45	-	#N/A	#N/A	14.34	#N/A	2 / 0.5	No	272,421.00	0.00	0.0	Off
DPE-10	8/15/18 14:00	-	#N/A	#N/A	14.34	#N/A	2 / 0.5	No	272,421.00	0.00	0.0	Off
DPE-10	10/10/18 17:05	22.50	12.45	10.05	14.34	4.29	2 / 0.5	No	272,424.20	3.20	0.0	Off - Recalibrated transducer depth after fall restart
DPE-10	10/18/18 14:15	22.50	14.93	7.57	14.34	6.77	2 / 0.5	No	272,447.20	23.00	0.0	Off
DPE-10	10/26/18 16:10	22.50	13.23	9.27	14.34	5.07	2 / 0.5	No	273,903.20	1,456.00	0.0	Off
DPE-10	11/7/18 16:10	22.50	15.22	7.28	14.34	7.06	2 / 0.5	No	273,903.20	0.00	0.0	Off
DPE-10	11/13/18 13:20	22.50	11.52	10.98	14.34	3.36	2 / 0.5	Yes	274,287.30	384.10	6.0	
DPE-10	11/21/18 14:10	22.50	14.85	7.65	14.34	6.69	2 / 0.5	No	275,539.10	1,251.80	0.0	Off
DPE-10	1/11/19 10:30	22.50	15.59	6.91	14.34	7.43	2 / 0.5	No	275,539.10	0.00	0.0	Off



Table 4-4  
Dual-Phase Extraction Well Groundwater Operational Data  
Former Unocal Edmonds Bulk Fuel Terminal  
11720 Unoco Road  
Edmonds, Washington

DPE-11												
DPE Well ID	Date and Time	Transducer Depth	Water above Transducer (LT-4011)	Depth to Water <sup>2</sup>	Casing Elevation	Groundwater Elevation	Variable Frequency Drive Setting	Vacuum Applied	Extracted Groundwater Volume Totalizer <sup>3</sup>	Periodic Extracted Groundwater Volume	Instantaneous DPE Well Groundwater Flow Rate <sup>4</sup>	Comments
	mm/dd/yy hh:mm <sup>1</sup>	ft btoc	ft	ft btoc	ft NAVD88	ft NAVD88	High/Low	yes/no	gal	gal	gpm	
DPE-11	11/28/17 9:56	#N/A	#N/A	6.13	14.27	8.14	#N/A	#N/A	318.47	#N/A	#N/A	DPE System Baseline Event before System Startup - Pump off
DPE-11	12/5/17 11:35	20.50	2.00	18.50	14.27	-4.23	2 / 0.5	No	453.55	135.08	#N/A	Groundwater elevation estimated based on transducer setting
DPE-11	12/13/17 9:30	20.50	2.00	18.50	14.27	-4.23	2 / 0.5	Yes	3,408.30	2,954.75	2.4	
DPE-11	12/13/17 14:00	20.50	2.00	18.50	14.27	-4.23	2 / 0.5	Yes	4,091.90	683.60	2.4	
DPE-11	12/14/17 10:25	20.50	2.00	18.50	14.27	-4.23	2 / 0.5	Yes	6,693.90	2,602.00	2.2	
DPE-11	12/20/17 12:50	20.50	2.00	18.50	14.27	-4.23	2 / 0.5	Yes	16,297.60	9,603.70	2.2	
DPE-11	12/27/17 12:15	20.50	2.00	18.50	14.27	-4.23	2 / 0.5	Yes	29,022.70	12,725.10	2.8	
DPE-11	1/5/18 16:20	20.50	2.00	18.50	14.27	-4.23	2 / 0.5	Yes	43,822.40	14,799.70	3.2	
DPE-11	1/9/18 16:25	20.50	4.00	16.50	14.27	-2.23	4 / 0.5	Yes	45,650.50	1,828.10	2.8	
DPE-11	1/18/18 14:20	20.50	4.00	16.50	14.27	-2.23	4 / 0.5	Yes	58,427.80	12,777.30	2.8	
DPE-11	1/24/18 13:30	20.50	2.00	18.50	14.27	-4.23	2 / 0.5	Yes	74,200.80	15,773.00	2.2	
DPE-11	2/1/18 10:10	20.50	2.00	18.50	14.27	-4.23	2 / 0.5	Yes	104,532.10	30,331.30	3.6	
DPE-11	2/8/18 10:00	20.50	15.92	4.58	14.27	9.69	2 / 0.5	No	112,402.00	7,869.90	0.0	Off
DPE-11	2/13/18 9:50	20.50	15.88	4.62	14.27	9.65	2 / 0.5	No	112,402.00	0.00	0.0	Off
DPE-11	2/20/18 14:00	20.50	2.00	18.50	14.27	-4.23	2 / 0.5	Yes	132,333.30	19,931.30	3.2	
DPE-11	2/28/18 14:00	20.50	15.59	4.91	14.27	9.36	2 / 0.5	No	136,719.20	4,385.90	0.0	Off
DPE-11	3/8/18 11:30	20.50	15.94	4.56	14.27	9.71	2 / 0.5	No	136,719.20	0.00	0.0	Off
DPE-11	3/14/18 12:00	20.50	15.97	4.53	14.27	9.74	2 / 0.5	No	136,719.20	0.00	0.0	Off
DPE-11	5/8/18 13:00	20.50	2.00	18.50	14.27	-4.23	2 / 0.5	Yes	136,801.20	82.00	4.0	
DPE-11	5/17/18 15:45	20.50	2.00	18.50	14.27	-4.23	2 / 0.5	Yes	177,717.60	40,916.40	4.6	
DPE-11	5/23/18 15:30	20.50	1.94	18.56	14.27	-4.29	2 / 0.5	Yes	212,613.50	34,895.90	4.4	
DPE-11	5/29/18 16:30	20.50	1.55	18.95	14.27	-4.68	2 / 0.5	Yes	250,270.30	37,656.80	5.0	
DPE-11	6/7/18 13:15	20.50	1.88	18.62	14.27	-4.35	2 / 0.5	Yes	274,351.50	24,081.20	4.4	
DPE-11	6/15/18 13:00	20.50	1.95	18.55	14.27	-4.28	2 / 0.5	Yes	295,909.20	21,557.70	6.0	
DPE-11	6/18/18 12:20	20.50	1.97	18.54	14.27	-4.27	#N/A	#N/A	#N/A	#N/A	#N/A	
DPE-11	7/5/18 12:00	20.50	2.00	18.50	14.27	-4.23	2 / 0.5	Yes	355,664.50	59,755.30	5.4	
DPE-11	7/11/18 11:35	20.50	7.23	13.27	14.27	1.00	2 / 0.5	Yes	396,622.50	40,958.00	5.6	
DPE-11	7/19/18 14:30	20.50	10.59	9.91	14.27	4.36	2 / 0.5	Yes	402,718.40	6,095.90	5.6	
DPE-11	7/26/18 15:00	20.50	8.18	12.32	14.27	1.95	2 / 0.5	Yes	444,975.50	42,257.10	5.4	
DPE-11	8/3/18 15:10	20.50	2.81	17.69	14.27	-3.42	2 / 0.5	Yes	477,673.50	32,698.00	5.6	
DPE-11	8/7/18 12:45	20.50	1.90	18.60	14.27	-4.33	2 / 0.5	Yes	511,052.50	33,379.00	5.6	
DPE-11	8/15/18 14:00	20.50	1.97	18.53	14.27	-4.26	2 / 0.5	Yes	565,837.50	54,785.00	5.4	
DPE-11	10/10/18 17:05	23.00	7.88	15.12	14.27	-0.85	2 / 0.5	No	567,668.50	1,831.00	6.2	
DPE-11	10/18/18 14:15	23.00	15.30	7.70	14.27	6.57	2 / 0.5	No	573,842.70	6,174.20	0.0	Off - Recalibrated transducer depth after fall restart
DPE-11	10/26/18 16:10	23.00	5.60	17.40	14.27	-3.13	2 / 0.5	No	575,888.80	2,046.10	5.8	
DPE-11	11/7/18 16:10	23.00	4.44	18.56	14.27	-4.29	2 / 0.5	No	577,438.50	1,549.70	5.6	
DPE-11	11/13/18 13:20	23.00	2.31	20.69	14.27	-6.42	2 / 0.5	Yes	619,811.50	42,373.00	6.8	
DPE-11	11/21/18 14:10	23.00	2.00	21.00	14.27	-6.73	2 / 0.5	Yes	657,146.60	37,335.10	6.0	
DPE-11	1/11/19 10:30	23.00	3.30	19.70	14.27	-5.43	2 / 0.5	No	762,008.30	104,861.70	7.2	

Table 4-4  
Dual-Phase Extraction Well Groundwater Operational Data  
Former Unocal Edmonds Bulk Fuel Terminal  
11720 Unoco Road  
Edmonds, Washington

DPE-12												
DPE Well ID	Date and Time	Transducer Depth	Water above Transducer (LT-4012)	Depth to Water <sup>2</sup>	Casing Elevation	Groundwater Elevation	Variable Frequency Drive Setting	Vacuum Applied	Extracted Groundwater Volume Totalizer <sup>3</sup>	Periodic Extracted Groundwater Volume	Instantaneous DPE Well Groundwater Flow Rate <sup>4</sup>	Comments
	mm/dd/yy hh:mm <sup>1</sup>	ft btoc	ft	ft btoc	ft NAVD88	ft NAVD88	High/Low	yes/no	gal	gal	gpm	
DPE-12	11/28/17 10:02	#N/A	#N/A	6.49	14.16	7.67	#N/A	#N/A	40.18	#N/A	#N/A	DPE System Baseline Event before System Startup - Pump off
DPE-12	12/5/17 11:35	20.50	#N/A	#N/A	14.16	#N/A	#N/A	No	32,421	32,380.82	#N/A	Transducer errors with pump testing and trouble shooting
DPE-12	12/13/17 9:30	20.50	#N/A	#N/A	14.16	#N/A	#N/A	No	58,161.00	25,740.00	0.0	Transducer errors with pump testing and trouble shooting
DPE-12	12/13/17 14:00	20.50	#N/A	#N/A	14.16	#N/A	--	No	58,161.00	0.00	0.0	Off
DPE-12	12/14/17 10:25	20.50	#N/A	#N/A	14.16	#N/A	--	No	58,161.00	0.00	0.0	Off
DPE-12	12/20/17 12:50	20.50	#N/A	#N/A	14.16	#N/A	--	No	58,161.00	0.00	0.0	Off
DPE-12	12/27/17 12:15	20.50	#N/A	#N/A	14.16	#N/A	--	No	58,161.00	0.00	0.0	Off
DPE-12	1/5/18 16:20	20.50	#N/A	#N/A	14.16	#N/A	--	No	58,161.00	0.00	0.0	Off
DPE-12	1/9/18 16:25	20.50	#N/A	#N/A	14.16	#N/A	--	No	58,161.00	0.00	0.0	Off
DPE-12	1/18/18 14:20	20.50	#N/A	#N/A	14.16	#N/A	--	No	58,161.00	0.00	0.0	Off
DPE-12	1/24/18 13:30	20.50	#N/A	#N/A	14.16	#N/A	--	No	58,161.00	0.00	0.0	Off
DPE-12	2/1/18 10:10	20.50	#N/A	#N/A	14.16	#N/A	--	No	58,161.00	0.00	0.0	Off
DPE-12	2/8/18 10:00	20.50	#N/A	#N/A	14.16	#N/A	--	No	58,161.00	0.00	0.0	Off
DPE-12	2/13/18 9:50	20.50	#N/A	#N/A	14.16	#N/A	--	No	58,161.00	0.00	0.0	Off
DPE-12	2/20/18 14:00	20.50	#N/A	#N/A	14.16	#N/A	--	No	58,161.00	0.00	0.0	Off
DPE-12	2/28/18 14:00	20.50	#N/A	#N/A	14.16	#N/A	--	No	58,161.00	0.00	0.0	Off
DPE-12	3/8/18 11:30	20.50	#N/A	#N/A	14.16	#N/A	--	No	58,161.00	0.00	0.0	Off
DPE-12	3/14/18 12:00	20.50	#N/A	#N/A	14.16	#N/A	--	No	58,161.00	0.00	0.0	Off
DPE-12-R	5/8/18 13:00	20.50	8.33	12.17	14.30	2.13	2 / 0.5	Yes	58,708.60	547.60	5.2	DPE-12 decommissioned; DPE-12R installed approximately four feet west
DPE-12-R	5/17/18 15:45	20.50	8.99	11.51	14.30	2.79	2 / 0.5	Yes	113,028.50	54,319.90	5.0	
DPE-12-R	5/23/18 15:30	20.50	8.77	11.73	14.30	2.57	2 / 0.5	Yes	158,502.60	45,474.10	5.4	
DPE-12-R	5/29/18 16:30	20.50	9.34	11.16	14.30	3.14	2 / 0.5	Yes	202,654.80	44,152.20	5.6	
DPE-12-R	6/7/18 13:15	20.50	9.30	11.20	14.30	3.10	2 / 0.5	Yes	230,704.80	28,050.00	5.8	
DPE-12-R	6/15/18 13:00	20.50	9.22	11.28	14.30	3.02	2 / 0.5	Yes	263,801.50	33,096.70	6.0	
DPE-12-R	6/18/18 12:20	20.50	8.60	11.90	14.30	2.40	#N/A	#N/A	#N/A	#N/A	#N/A	
DPE-12-R	7/5/18 12:00	20.50	8.90	11.60	14.30	2.70	2 / 0.5	Yes	332,619.10	68,817.60	5.8	
DPE-12-R	7/11/18 11:35	20.50	9.01	11.49	14.30	2.81	2 / 0.5	Yes	382,016.80	49,397.70	5.8	
DPE-12-R	7/19/18 14:30	20.50	9.34	11.16	14.30	3.14	2 / 0.5	Yes	388,021.80	6,005.00	5.6	
DPE-12-R	7/26/18 15:00	20.50	9.22	11.28	14.30	3.02	2 / 0.5	Yes	435,243.80	47,222.00	5.6	
DPE-12-R	8/3/18 15:10	20.50	9.02	11.48	14.30	2.82	2 / 0.5	Yes	469,798.60	34,554.80	5.6	
DPE-12-R	8/7/18 12:45	20.50	8.65	11.85	14.30	2.45	2 / 0.5	Yes	505,681.50	35,882.90	5.6	
DPE-12-R	8/15/18 14:00	20.50	8.87	11.63	14.30	2.67	2 / 0.5	Yes	571,773.40	66,091.90	5.8	
DPE-12-R	10/10/18 17:05	22.00	10.31	11.69	14.30	2.61	2 / 0.5	No	573,505.50	1,732.10	7.0	
DPE-12-R	10/18/18 14:15	22.00	14.33	7.67	14.30	6.63	2 / 0.5	No	579,780.00	6,274.50	0.0	Recalibrated transducer depth after fall restart
DPE-12-R	10/26/18 16:10	22.00	10.55	11.45	14.30	2.85	2 / 0.5	No	581,983.10	2,203.10	6.0	
DPE-12-R	11/7/18 16:10	22.00	10.50	11.50	14.30	2.80	2 / 0.5	No	583,532.90	10,027.40	6.2	
DPE-12-R	11/13/18 13:20	22.00	9.53	12.47	14.30	1.83	2 / 0.5	Yes	627,396.50	43,863.60	7.0	
DPE-12-R	11/21/18 14:10	22.00	10.30	11.70	14.30	2.60	2 / 0.5	Yes	668,290.10	40,893.60	6.2	
DPE-12-R	1/11/19 10:30	22.00	10.00	12.00	14.30	2.30	2 / 0.5	No	778,883.50	110,593.40	7.6	

Table 4-4  
Dual-Phase Extraction Well Groundwater Operational Data  
Former Unocal Edmonds Bulk Fuel Terminal  
11720 Unoco Road  
Edmonds, Washington

DPE-13												
DPE Well ID	Date and Time	Transducer Depth	Water above Transducer (LT-4013)	Depth to Water <sup>2</sup>	Casing Elevation	Groundwater Elevation	Variable Frequency Drive Setting	Vacuum Applied	Extracted Groundwater Volume Totalizer <sup>3</sup>	Periodic Extracted Groundwater Volume	Instantaneous DPE Well Groundwater Flow Rate <sup>4</sup>	Comments
	mm/dd/yy hh:mm <sup>1</sup>	ft btoc	ft	ft btoc	ft NAVD88	ft NAVD88	High/Low	yes/no	gal	gal	gpm	
DPE-13	11/28/17 10:06	#N/A	#N/A	5.90	13.77	7.87	#N/A	#N/A	81.12	#N/A	#N/A	DPE System Baseline Event before System Startup - Pump off
DPE-13	12/5/17 11:35	20.50	10	10.50	13.77	3.27	10 / 0.5	No	31,850	31,768.88	#N/A	Groundwater elevation estimated based on transducer setting
DPE-13	12/13/17 9:30	20.50	6.60	13.90	13.77	-0.13	2 / 0.5	Yes	34,433.30	2,583.30	5.4	
DPE-13	12/13/17 14:00	20.50	6.50	14.00	13.77	-0.23	2 / 0.5	Yes	35,809.00	1,375.70	5.4	
DPE-13	12/14/17 10:25	20.50	6.30	14.20	13.77	-0.43	2 / 0.5	Yes	42,284.10	6,475.10	5.2	
DPE-13	12/20/17 12:50	20.50	7.50	13.00	13.77	0.77	2 / 0.5	Yes	96,996.20	54,712.10	5.4	
DPE-13	12/27/17 12:15	20.50	8.10	12.40	13.77	1.37	2 / 0.5	Yes	127,837.20	30,841.00	5.3	
DPE-13	1/5/18 16:20	20.50	9.66	10.84	13.77	2.93	2 / 0.5	Yes	159,789.40	31,952.20	5.6	
DPE-13	1/9/18 16:25	20.50	10.00	10.50	13.77	3.27	4 / 0.5	Yes	162,903.20	3,113.80	5.4	
DPE-13	1/18/18 14:20	20.50	10.18	10.32	13.77	3.45	4 / 0.5	Yes	187,700.40	24,797.20	5.4	
DPE-13	1/24/18 13:30	20.50	10.50	10.00	13.77	3.77	2 / 0.5	Yes	217,933.20	30,232.80	5.8	
DPE-13	2/1/18 10:10	20.50	9.47	11.03	13.77	2.74	2 / 0.5	Yes	267,457.30	49,524.10	5.8	
DPE-13	2/8/18 10:00	20.50	5.89	14.61	13.77	-0.84	2 / 0.5	No	280,653.80	13,196.50	0.0	Off
DPE-13	2/13/18 9:50	20.50	15.80	4.70	13.77	9.07	2 / 0.5	No	280,653.80	0.00	0.0	Off
DPE-13	2/20/18 14:00	20.50	9.45	11.05	13.77	2.72	2 / 0.5	No	314,463.50	33,809.70	4.2	
DPE-13	2/28/18 14:00	20.50	15.68	4.82	13.77	8.95	2 / 0.5	No	321,791.60	7,328.10	0.0	Off
DPE-13	3/8/18 11:30	20.50	15.95	4.55	13.77	9.22	2 / 0.5	No	321,791.60	0.00	0.0	Off
DPE-13	3/14/18 12:00	20.50	15.95	4.55	13.77	9.22	2 / 0.5	No	321,791.60	0.00	0.0	Off
DPE-13	5/8/18 13:00	20.50	9.89	10.61	13.77	3.16	2 / 0.5	Yes	322,410.10	618.50	5.8	
DPE-13	5/17/18 15:45	20.50	9.81	10.69	13.77	3.08	2 / 0.5	Yes	384,295.30	61,885.20	6.0	
DPE-13	5/23/18 15:30	20.50	9.9	10.60	13.77	3.17	2 / 0.5	Yes	434,629.20	50,333.90	5.8	
DPE-13	5/29/18 16:30	20.50	10.56	9.94	13.77	3.83	2 / 0.5	Yes	482,519.80	47,890.60	5.8	
DPE-13	6/7/18 13:15	20.50	10.81	9.69	13.77	4.08	2 / 0.5	Yes	511,278.90	28,759.10	5.8	
DPE-13	6/15/18 13:00	20.50	10.38	10.12	13.77	3.65	2 / 0.5	Yes	544,461.50	33,182.60	5.8	
DPE-13	6/18/18 12:20	20.50	9.93	10.57	13.77	3.20	#N/A	#N/A	#N/A	#N/A	#N/A	
DPE-13	7/5/18 12:00	20.50	10.00	10.50	13.77	3.27	2 / 0.5	Yes	611,165.50	66,704.00	5.6	
DPE-13	7/11/18 11:35	20.50	10.04	10.46	13.77	3.31	2 / 0.5	Yes	659,433.50	48,268.00	5.2	
DPE-13	7/19/18 14:30	20.50	10.54	9.96	13.77	3.81	2 / 0.5	Yes	665,104.40	5,670.90	5.2	
DPE-13	7/26/18 15:00	20.50	10.60	9.90	13.77	3.87	2 / 0.5	Yes	708,149.20	43,044.80	5.4	
DPE-13	8/3/18 15:10	20.50	10.00	10.50	13.77	3.27	2 / 0.5	Yes	758,551.80	50,402.60	5.2	
DPE-13	8/7/18 12:45	20.50	9.83	10.67	13.77	3.10	2 / 0.5	Yes	768,863.70	10,311.90	5.2	
DPE-13	8/15/18 14:00	20.50	10.33	10.17	13.77	3.60	2 / 0.5	Yes	822,798.20	53,934.50	5.4	
DPE-13	10/10/18 17:05	22.50	11.69	10.81	13.77	2.96	2 / 0.5	No	824,115.10	1,316.90	0.0	Off - Recalibrated transducer depth after fall restart
DPE-13	10/18/18 14:15	22.50	15.52	6.98	13.77	6.79	2 / 0.5	No	824,295.50	180.40	0.0	Off
DPE-13	10/26/18 16:10	22.50	15.28	7.22	13.77	6.55	2 / 0.5	No	824,453.40	157.90	0.0	Off
DPE-13	11/7/18 16:10	22.50	15.2	7.30	13.77	6.47	2 / 0.5	No	824,453.40	0.00	0.0	Off
DPE-13	11/13/18 13:20	22.50	10.9	11.60	13.77	2.17	2 / 0.5	Yes	824,816.60	363.20	5.4	
DPE-13	11/21/18 14:10	22.50	15.13	7.37	13.77	6.40	2 / 0.5	No	825,913.40	1,096.80	0.0	Off
DPE-13	1/11/19 10:30	22.50	11.10	11.40	13.77	2.37	2 / 0.5	No	893,258.00	67,344.60	5.8	

Table 4-4  
Dual-Phase Extraction Well Groundwater Operational Data  
Former Unocal Edmonds Bulk Fuel Terminal  
11720 Unoco Road  
Edmonds, Washington

DPE-14												
DPE Well ID	Date and Time	Transducer Depth	Water above Transducer (LT-4014)	Depth to Water <sup>2</sup>	Casing Elevation	Groundwater Elevation	Variable Frequency Drive Setting	Vacuum Applied	Extracted Groundwater Volume Totalizer <sup>3</sup>	Periodic Extracted Groundwater Volume	Instantaneous DPE Well Groundwater Flow Rate <sup>4</sup>	Comments
	mm/dd/yy hh:mm <sup>1</sup>	ft btoc	ft	ft btoc	ft NAVD88	ft NAVD88	High/Low	yes/no	gal	gal	gpm	
DPE-14	11/28/17 10:18	#N/A	#N/A	5.72	13.67	7.95	#N/A	#N/A	37.03	#N/A	#N/A	DPE System Baseline Event before System Startup - Pump off
DPE-14	12/5/17 11:35	20.50	2.00	18.50	13.67	-4.83	2 / 0.5	No	23,220	23,182.97	#N/A	Groundwater elevation estimated based on transducer setting
DPE-14	12/13/17 9:30	20.50	2.00	18.50	13.67	-4.83	2 / 0.5	Yes	47,810.00	24,590.00	5.0	
DPE-14	12/13/17 14:00	20.50	2.00	18.50	13.67	-4.83	2 / 0.5	Yes	49,130.90	1,320.90	5.0	
DPE-14	12/14/17 10:25	20.50	2.00	18.50	13.67	-4.83	2 / 0.5	Yes	54,529.10	5,398.20	4.8	
DPE-14	12/20/17 12:50	20.50	3.00	17.50	13.67	-3.83	2 / 0.5	Yes	75,867.00	21,337.90	5.0	
DPE-14	12/27/17 12:15	20.50	2.48	18.02	13.67	-4.35	2 / 0.5	Yes	103,867.20	28,000.20	5.0	
DPE-14	1/5/18 16:20	20.50	4.00	16.50	13.67	-2.83	2 / 0.5	Yes	131,365.30	27,498.10	5.0	
DPE-14	1/9/18 16:25	20.50	5.25	15.25	13.67	-1.58	4 / 0.5	Yes	134,142.60	2,777.30	5.0	
DPE-14	1/18/18 14:20	20.50	4.00	16.50	13.67	-2.83	4 / 0.5	Yes	156,331.30	22,188.70	5.0	
DPE-14	1/24/18 13:30	20.50	4.00	16.50	13.67	-2.83	2 / 0.5	Yes	182,560.10	26,228.80	5.2	
DPE-14	2/1/18 10:10	20.50	4.36	16.14	13.67	-2.47	2 / 0.5	Yes	231,111.00	48,550.90	5.8	
DPE-14	2/8/18 10:00	20.50	5.85	14.65	13.67	-0.98	2 / 0.5	No	244,698.20	13,587.20	0.0	Off
DPE-14	2/13/18 9:50	20.50	15.78	4.72	13.67	8.95	2 / 0.5	No	244,698.20	0.00	0.0	Off
DPE-14	2/20/18 14:00	20.50	2.00	18.50	13.67	-4.83	2 / 0.5	No	276,964.30	32,266.10	5.2	
DPE-14	2/28/18 14:00	20.50	15.72	4.78	13.67	8.89	2 / 0.5	No	282,025.40	5,061.10	0.0	Off
DPE-14	3/8/18 11:30	20.50	15.96	4.54	13.67	9.13	2 / 0.5	No	282,025.40	0.00	0.0	Off
DPE-14	3/14/18 12:00	20.50	15.91	4.59	13.67	9.08	2 / 0.5	No	282,025.40	0.00	0.0	Off
DPE-14	5/8/18 13:00	20.50	3.00	17.50	13.67	-3.83	2 / 0.5	Yes	283,573.70	1,548.30	4.8	
DPE-14	5/17/18 15:45	20.50	3.00	17.50	13.67	-3.83	2 / 0.5	Yes	338,969.20	55,395.50	5.4	
DPE-14	5/23/18 15:30	20.50	2.13	18.37	13.67	-4.70	2 / 0.5	Yes	382,606.70	43,637.50	5.4	
DPE-14	5/29/18 16:30	20.50	4.69	15.81	13.67	-2.14	2 / 0.5	Yes	426,920.80	44,314.10	5.8	
DPE-14	6/7/18 13:15	20.50	1.92	18.58	13.67	-4.91	2 / 0.5	Yes	454,622.90	27,702.10	5.6	
DPE-14	6/15/18 13:00	20.50	2.18	18.32	13.67	-4.65	2 / 0.5	Yes	480,890.90	26,268.00	5.6	
DPE-14	6/18/18 12:20	20.50	1.98	18.53	13.67	-4.86	#N/A	#N/A	#N/A	#N/A	#N/A	
DPE-14	7/5/18 12:00	20.50	2.00	18.50	13.67	-4.83	2 / 0.5	Yes	542,982.40	62,091.50	5.4	
DPE-14	7/11/18 11:35	20.50	3.00	17.50	13.67	-3.83	2 / 0.5	Yes	587,363.50	44,381.10	5.6	
DPE-14	7/19/18 14:30	20.50	2.91	17.59	13.67	-3.92	2 / 0.5	Yes	593,061.50	5,698.00	5.6	
DPE-14	7/26/18 15:00	20.50	6.42	14.08	13.67	-0.41	2 / 0.5	Yes	634,059.40	40,997.90	5.6	
DPE-14	8/3/18 15:10	20.50	2.62	17.88	13.67	-4.21	2 / 0.5	Yes	664,259.30	30,199.90	5.6	
DPE-14	8/7/18 12:45	20.50	1.92	18.58	13.67	-4.91	2 / 0.5	Yes	694,892.70	30,633.40	5.4	
DPE-14	8/15/18 14:00	20.50	2.00	18.50	13.67	-4.83	2 / 0.5	Yes	748,458.60	53,565.90	5.4	
DPE-14	10/10/18 17:05	23.00	4.74	18.26	13.67	-4.59	2 / 0.5	No	749,738.20	1,279.60	0.0	Off - Recalibrated transducer depth after fall restart
DPE-14	10/18/18 14:15	23.00	15.53	7.47	13.67	6.20	2 / 0.5	No	749,852.60	114.40	0.0	Off
DPE-14	10/26/18 16:10	23.00	15.46	7.54	13.67	6.13	2 / 0.5	No	750,112.70	260.10	0.0	Off
DPE-14	11/7/18 16:10	23.00	15.4	7.60	13.67	6.07	2 / 0.5	No	750,112.70	0.00	0.0	Off
DPE-14	11/13/18 13:20	23.00	4.56	18.44	13.67	-4.77	2 / 0.5	Yes	750,486.50	373.80	5.6	
DPE-14	11/21/18 14:10	23.00	15.31	7.69	13.67	5.98	2 / 0.5	No	751,625.60	1,139.10	0.0	Off
DPE-14	1/11/19 10:30	23.00	2.00	21.00	13.67	-7.33	2 / 0.5	No	814,100.10	62,474.50	5.2	

**Notes**  
**Former Unocal Edmonds Bulk Fuel Terminal**  
**11720 Unoco Road**  
**Edmonds, Washington**

Data Sheet Name	Notes
<b>Table 4-4</b> <b>Dual-Phase</b> <b>Extraction Well</b> <b>Groundwater</b> <b>Operational Data</b>	1. hh:mm in data sheets is reported in 24 hour format 2. DPE well depth to water based on transducer readings 3. Totalizer reading at each DPE well 4. Instantaneous DPE well groundwater flow rate reads from flowmeter. Grundfos Redi-flo 4 top-loading electric submersible pump. DPE well = dual phase extraction well; remediation well used for both groundwater and soil vapor extraction ft = feet ft btoc = feet below top of casing gal = gallons gpm = gallons per minute #N/A = not applicable, not available NAVD88 = North American Vertical Datum of 1988

**Table 4-5**  
**Dual Phase Extraction Well Vapor Data**  
**Former Unocal Edmonds Bulk Fuel Terminal**  
**11720 Unoco Road**  
**Edmonds, Washington**

DPE-01							
DPE Well ID	Date	Time	Manifold SVE Valve Position	Wellhead Vacuum	Manifold Vacuum	VOCs Concentration <sup>2</sup> .	Comments
	mm/dd/yy	hh:mm <sup>1</sup> .	% open	in Hg	in Hg	ppmv	
DPE-01	12/13/2017	10:15	100	9.0	11.0	1100.0	
DPE-01	12/13/2017	14:35	100	9.0	9.5	1150.0	
DPE-01	12/14/2017	12:00	100	9.5	8.5	710.5	
DPE-01	12/20/2017	13:30	100	11.0	16.0	489.1	
DPE-01	12/20/2017	13:40	100	10.0	13.5	372.6	
DPE-01	1/5/2018	16:45	100	11.0	13.0	469.6	
DPE-01	1/9/2018	17:00	100	5.0	8.5	399.0	
DPE-01	1/18/2018	14:50	100	5.5	8.0	155.6	
DPE-01	1/25/2018	9:00	100	7.0	7.0	132.8	
DPE-01	2/1/2018	11:00	100	7.0	11.0	102.3	
DPE-01	2/8/2018	10:20	100	6.0	7.0	97.9	
DPE-01	2/16/2018	13:15	100	13.0	15.0	93.2	
DPE-01	2/20/2018	14:30	100	5.5	5.5	122.2	
DPE-01	2/28/2018	14:30	100	7.0	10.0	101.3	
DPE-01	3/8/2018	12:00	100	8.0	8.5	#N/A	Water in line
DPE-01	3/14/2018	12:30	100	8.5	9.0	#N/A	Water in line
DPE-01	5/8/2018	14:10	100	4.5	10.5	49.2	
DPE-01	5/17/2018	16:45	0	0.0	9.0	#N/A	SVE Off
DPE-01	5/23/2018	16:25	0	0.0	10.5	#N/A	SVE Off
DPE-01	5/29/2018	17:00	100	7.0	18.0	#N/A	Water in line
DPE-01	6/7/2018	16:45	100	9.5	23.0	116.5	
DPE-01	6/15/2018	14:00	10	5.0	12.0	148.0	
DPE-01	7/5/2018	13:00	0	0.0	0.0	#N/A	SVE Off
DPE-01	7/11/2018	14:10	100	5.5	17.0	53.0	
DPE-01	7/19/2018	15:00	100	5.0	15.0	106.0	
DPE-01	7/26/2018	16:00	100	7.0	21.0	84.0	
DPE-01	8/3/2018	15:30	0	0.0	12.0	#N/A	SVE Off
DPE-01	8/7/2018	12:30	0	0.0	13.0	#N/A	SVE Off
DPE-01	8/15/2018	14:30	0	0.0	13.0	#N/A	SVE Off
DPE-01	10/10/2018	17:10	0	0.0	0.0	#N/A	SVE Off
DPE-01	10/18/2018	16:00	100	6.0	14.0	135.2	
DPE-01	10/26/2018	16:30	100	6.0	13.0	132.7	
DPE-01	11/7/2018	16:30	100	6.0	18.5	123.7	
DPE-01	11/13/2018	14:00	100	4.0	12.5	93.1	
DPE-01	11/21/2018	14:20	100	5.0	11.0	82.9	

**Table 4-5**  
**Dual Phase Extraction Well Vapor Data**  
**Former Unocal Edmonds Bulk Fuel Terminal**  
**11720 Unoco Road**  
**Edmonds, Washington**

DPE-02							
DPE Well ID	Date	Time	Manifold SVE Valve Position	Wellhead Vacuum	Manifold Vacuum	VOCs Concentration <sup>2</sup> .	Comments
	mm/dd/yy	hh:mm <sup>1</sup> .	% open	in Hg	in Hg	ppmv	
DPE-02	12/13/2017	10:15	100	9.0	9.5	335.8	
DPE-02	12/13/2017	14:35	100	9.0	9.0	374.2	
DPE-02	12/14/2017	12:00	100	9.0	8.5	311.2	
DPE-02	12/20/2017	13:30	100	10.5	13.5	136.4	
DPE-02	12/27/2017	13:40	100	9.5	11	154.1	
DPE-02	1/5/2018	16:45	100	10.0	13.0	140.2	
DPE-02	1/9/2018	17:00	100	5.0	4.5	139.5	
DPE-02	1/18/2018	14:50	100	5.5	7.5	57.8	
DPE-02	1/25/2018	9:00	100	7.0	7.0	46.7	
DPE-02	2/1/2018	11:00	100	6.5	9.0	36.7	
DPE-02	2/8/2018	10:20	100	6.0	6.0	26.3	
DPE-02	2/16/2018	13:15	100	10.0	13.0	21.5	
DPE-02	2/20/2018	14:30	100	6.0	4.5	28.7	
DPE-02	2/28/2018	14:30	100	7.0	9.0	22.2	
DPE-02	3/8/2018	12:00	100	9.0	9.0	16.4	
DPE-02	3/14/2018	12:30	100	9.0	9.5	16.2	
DPE-02	5/8/2018	14:10	100	4.5	10.0	10.3	
DPE-02	5/17/2018	16:45	0	0.0	6.0	#N/A	SVE Off
DPE-02	5/23/2018	16:25	0	0.0	6.0	#N/A	SVE Off
DPE-02	5/29/2018	17:00	100	6.5	13.5	5.3	
DPE-02	6/7/2018	16:45	100	7.0	16.0	11.7	
DPE-02	6/15/2018	14:00	20	2.0	6.0	11.0	
DPE-02	7/5/2018	13:00	0	0.0	0.0	#N/A	SVE Off
DPE-02	7/11/2018	14:10	100	5.0	12.0	2.0	
DPE-02	7/19/2018	15:00	100	5.0	11.0	15.0	
DPE-02	7/26/2018	16:00	100	5.0	14.0	2.1	
DPE-02	8/3/2018	15:30	0	0.0	6.0	#N/A	SVE Off
DPE-02	8/7/2018	12:30	0	0.0	6.5	#N/A	SVE Off
DPE-02	8/15/2018	14:30	0	0.0	7.0	#N/A	SVE Off
DPE-02	10/10/2018	17:10	0	0.0	0.0	#N/A	SVE Off
DPE-02	10/18/2018	16:00	100	5.0	8.0	18.8	
DPE-02	10/26/2018	16:30	100	5.0	7.5	15.3	
DPE-02	11/7/2018	16:30	100	5.5	12.5	8.0	
DPE-02	11/13/2018	14:00	100	4.0	6.5	6.4	
DPE-02	11/21/2018	14:20	100	5.0	7.0	6.8	

**Table 4-5**  
**Dual Phase Extraction Well Vapor Data**  
**Former Unocal Edmonds Bulk Fuel Terminal**  
**11720 Unoco Road**  
**Edmonds, Washington**

DPE-03							
DPE Well ID	Date	Time	Manifold SVE Valve Position	Wellhead Vacuum	Manifold Vacuum	VOCs Concentration <sup>2</sup> .	Comments
	mm/dd/yy	hh:mm <sup>1</sup> .	% open	in Hg	in Hg	ppmv	
DPE-03	12/13/2017	10:15	100	9.0	12.0	365.0	
DPE-03	12/13/2017	14:35	100	9.0	10.5	396.5	
DPE-03	12/14/2017	12:00	100	9.0	10.0	299.1	
DPE-03	12/20/2017	13:30	100	10.0	14.0	89.9	Water in line
DPE-03	12/27/2017	13:40	100	10.0	14.0	57.3	
DPE-03	1/5/2018	16:45	100	11.0	15.0	75.4	
DPE-03	1/9/2018	17:00	100	5.0	5.0	73.2	
DPE-03	1/18/2018	14:50	100	5.0	9.5	29.1	
DPE-03	1/25/2018	9:00	40	2.5	3.0	12.7	
DPE-03	2/1/2018	11:00	100	7.0	10.0	66.2	
DPE-03	2/8/2018	10:20	100	5.5	8.5	26.2	
DPE-03	2/16/2018	13:15	100	13.0	15.0	#N/A	Water in line
DPE-03	2/20/2018	14:30	100	6.0	5.5	36.4	
DPE-03	2/28/2018	14:30	100	7.0	11.0	9.6	
DPE-03	3/8/2018	12:00	100	7.0	10.0	26.7	
DPE-03	3/14/2018	12:30	100	9.5	11.5	7.5	
DPE-03	5/8/2018	14:10	100	5.0	14.5	18.8	
DPE-03	5/17/2018	16:45	0	0.0	9.0	#N/A	SVE Off
DPE-03	5/23/2018	16:25	0	0.0	10.0	#N/A	SVE Off
DPE-03	5/29/2018	17:00	100	7.0	18.0	53.6	
DPE-03	6/7/2018	16:45	100	8.0	21.0	#N/A	Water in line
DPE-03	6/15/2018	14:00	100	6.0	15.0	20.0	
DPE-03	7/5/2018	13:00	0	0.0	0.0	#N/A	SVE Off
DPE-03	7/11/2018	14:10	100	5.0	17.0	27.0	
DPE-03	7/19/2018	15:00	100	5.0	15.0	18.0	
DPE-03	7/26/2018	16:00	100	6.5	21.0	16.0	
DPE-03	8/3/2018	15:30	0	0.0	11.0	#N/A	SVE Off
DPE-03	8/7/2018	12:30	0	0.0	12.5	#N/A	SVE Off
DPE-03	8/15/2018	14:30	0	0.0	14.0	#N/A	SVE Off
DPE-03	10/10/2018	17:10	0	0.0	0.0	#N/A	SVE Off
DPE-03	10/18/2018	16:00	100	9.0	14.0	35.8	
DPE-03	10/26/2018	16:30	100	5.0	14.0	30.1	
DPE-03	11/7/2018	16:30	100	5.0	17.0	19.5	
DPE-03	11/13/2018	14:00	100	4.0	12.5	5.4	
DPE-03	11/21/2018	14:20	100	5.0	12.5	5.6	



**Table 4-5**  
**Dual Phase Extraction Well Vapor Data**  
**Former Unocal Edmonds Bulk Fuel Terminal**  
**11720 Unoco Road**  
**Edmonds, Washington**

DPE-04							
DPE Well ID	Date	Time	Manifold SVE Valve Position	Wellhead Vacuum	Manifold Vacuum	VOCs Concentration <sup>2</sup> .	Comments
	mm/dd/yy	hh:mm <sup>1</sup> .	% open	in Hg	in Hg	ppmv	
DPE-04	12/13/2017	10:15	100	9.0	10.5	596.0	
DPE-04	12/13/2017	14:35	100	9.0	9.5	780.7	
DPE-04	12/14/2017	12:00	100	9.0	9.5	612.5	
DPE-04	12/20/2017	13:30	100	11.0	14.5	520.2	
DPE-04	12/27/2017	13:40	100	10.0	14.0	231.2	
DPE-04	1/5/2018	16:45	100	11.0	14.5	281.2	
DPE-04	1/9/2018	17:00	100	5.5	5.0	307.6	
DPE-04	1/18/2018	14:50	100	5.5	8.0	62.6	
DPE-04	1/25/2018	9:00	50	6.0	5.0	40.1	
DPE-04	2/1/2018	11:00	100	7.0	8.5	47.2	
DPE-04	2/8/2018	10:20	100	6.0	7.0	45.2	
DPE-04	2/16/2018	13:15	100	13.0	15.0	482.1	
DPE-04	2/20/2018	14:30	100	6.0	5.5	56.8	
DPE-04	2/28/2018	14:30	100	7.0	10.5	45.4	
DPE-04	3/8/2018	12:00	100	7.0	9.0	68.2	
DPE-04	3/14/2018	12:30	100	9.5	10.0	27.3	
DPE-04	5/8/2018	14:10	100	5.0	14.0	50.2	
DPE-04	5/17/2018	16:45	0	0.0	7.0	#N/A	SVE Off
DPE-04	5/23/2018	16:25	0	0.0	9.0	#N/A	SVE Off
DPE-04	5/29/2018	17:00	100	7.0	16.0	#N/A	Water in line
DPE-04	6/7/2018	16:45	100	8.0	20.0	73.8	
DPE-04	6/15/2018	14:00	100	6.0	14.0	53.0	
DPE-04	7/5/2018	13:00	0	0.0	0.0	#N/A	SVE Off
DPE-04	7/11/2018	14:10	100	5.5	16.0	309.0	
DPE-04	7/19/2018	15:00	100	5.0	14.0	39.0	
DPE-04	7/26/2018	16:00	100	6.5	20.0	54.0	
DPE-04	8/3/2018	15:30	0	0.0	10.0	#N/A	SVE Off
DPE-04	8/7/2018	12:30	0	0.0	11.0	#N/A	SVE Off
DPE-04	8/15/2018	14:30	0	0.0	11.0	#N/A	SVE Off
DPE-04	10/10/2018	17:10	0	0.0	0.0	#N/A	SVE Off / Faulted
DPE-04	10/18/2018	16:00	0	5.0	9.0	#N/A	SVE Off / Faulted
DPE-04	10/26/2018	16:30	0	5.0	10.0	#N/A	SVE Off / Faulted
DPE-04	11/7/2018	16:30	0	0.0	7.5	#N/A	SVE Off / Faulted
DPE-04	11/13/2018	14:00	0	0.0	7.5	#N/A	SVE Off / Faulted
DPE-04	11/21/2018	14:20	0	0.0	7.5	#N/A	SVE Off / Faulted

**Table 4-5**  
**Dual Phase Extraction Well Vapor Data**  
**Former Unocal Edmonds Bulk Fuel Terminal**  
**11720 Unoco Road**  
**Edmonds, Washington**

DPE-05							
DPE Well ID	Date	Time	Manifold SVE Valve Position	Wellhead Vacuum	Manifold Vacuum	VOCs Concentration <sup>2</sup> .	Comments
	mm/dd/yy	hh:mm <sup>1</sup> .	% open	in Hg	in Hg	ppmv	
DPE-05	12/13/2017	10:15	100	7.0	8.0	83.3	
DPE-05	12/13/2017	14:35	100	7.0	7.0	88.8	
DPE-05	12/14/2017	12:00	100	6.5	7.0	53.4	
DPE-05	12/20/2017	13:30	100	9.0	13.0	14.0	
DPE-05	12/27/2017	13:40	100	9.0	11.0	5.1	
DPE-05	1/5/2018	16:45	100	9.0	10.5	6.8	
DPE-05	1/9/2018	17:00	100	5.0	4.0	2.6	
DPE-05	1/18/2018	14:50	100	5.0	6.0	2.6	
DPE-05	1/25/2018	9:00	60	5.5	4.5	2.7	
DPE-05	2/1/2018	11:00	100	6.5	7.0	3.1	
DPE-05	2/8/2018	10:20	100	5.5	6.0	3.4	
DPE-05	2/16/2018	13:15	60	7.0	7.0	0.0	
DPE-05	2/20/2018	14:30	100	4.5	4.0	4.8	
DPE-05	2/28/2018	14:30	100	5.5	8.0	3.5	
DPE-05	3/8/2018	12:00	80	7.5	7.5	3.5	
DPE-05	3/14/2018	12:30	80	7.0	9.0	1.0	
DPE-05	5/8/2018	14:10	100	4.5	8.5	1.2	
DPE-05	5/17/2018	16:45	0	0.0	0.0	#N/A	SVE Off
DPE-05	5/23/2018	16:25	0	0.0	0.0	#N/A	SVE Off
DPE-05	5/29/2018	17:00	0	0.0	0.0	#N/A	SVE Off
DPE-05	6/7/2018	16:45	0	5.0	10.0	#N/A	
DPE-05	6/15/2018	14:00	5	0.5	1.5	2.0	
DPE-05	7/5/2018	13:00	0	0.0	0.0	#N/A	SVE Off
DPE-05	7/11/2018	14:10	0	0.0	0.0	4.0	SVE Off
DPE-05	7/19/2018	15:00	0	0.0	0.0	#N/A	SVE Off
DPE-05	7/26/2018	16:00	0	0.0	0.0	#N/A	SVE Off
DPE-05	8/3/2018	15:30	0	0.0	0.0	#N/A	SVE Off
DPE-05	8/7/2018	12:30	0	0.0	0.0	#N/A	SVE Off
DPE-05	8/15/2018	14:30	0	0.0	0.0	#N/A	SVE Off
DPE-05	10/10/2018	17:10	0	0.0	0.0	#N/A	SVE Off
DPE-05	10/18/2018	16:00	100	4.0	4.0	2.9	
DPE-05	10/26/2018	16:30	100	4.5	4.5	3.1	
DPE-05	11/7/2018	16:30	100	5.0	8.0	1.5	
DPE-05	11/13/2018	14:00	100	3.0	2.0	1.2	
DPE-05	11/21/2018	14:20	100	4.0	4.5	1.3	

**Table 4-5**  
**Dual Phase Extraction Well Vapor Data**  
**Former Unocal Edmonds Bulk Fuel Terminal**  
**11720 Unoco Road**  
**Edmonds, Washington**

DPE-06							
DPE Well ID	Date	Time	Manifold SVE Valve Position	Wellhead Vacuum	Manifold Vacuum	VOCs Concentration <sup>2</sup> .	Comments
	mm/dd/yy	hh:mm <sup>1</sup> .	% open	in Hg	in Hg	ppmv	
DPE-06	12/13/2017	10:15	100	9.0	8.0	20.2	
DPE-06	12/13/2017	14:35	100	9.0	8.0	32.5	
DPE-06	12/14/2017	12:00	100	9.0	8.0	11.0	
DPE-06	12/20/2017	13:30	100	11.0	13.0	9.1	
DPE-06	12/27/2017	13:40	100	10	11	4.1	
DPE-06	1/5/2018	16:45	100	10	12	5.8	
DPE-06	1/9/2018	17:00	100	5.0	5.0	3.1	
DPE-06	1/18/2018	14:50	100	5.0	7.5	3.0	
DPE-06	1/25/2018	9:00	100	8.0	9.5	1.7	
DPE-06	2/1/2018	11:00	100	7.0	9.5	2.2	
DPE-06	2/8/2018	10:20	100	6.0	7.5	1.9	
DPE-06	2/16/2018	13:15	100	14.0	15.5	0.0	
DPE-06	2/20/2018	14:30	100	6.0	6.0	3.2	
DPE-06	2/28/2018	14:30	100	7.0	10.0	2.2	
DPE-06	3/8/2018	12:00	100	10.0	10.5	2.0	
DPE-06	3/14/2018	12:30	100	9.5	13.5	0.7	
DPE-06	5/8/2018	14:10	100	5.0	12.0	0.2	
DPE-06	5/17/2018	16:45	0	0.0	6.5	#N/A	SVE Off
DPE-06	5/23/2018	16:25	0	0.0	7.0	#N/A	SVE Off
DPE-06	5/29/2018	17:00	100	7.0	14.0	1.9	
DPE-06	6/7/2018	16:45	100	8.0	18.0	2.5	
DPE-06	6/15/2018	14:00	100	6.0	10.0	1.0	
DPE-06	7/5/2018	13:00	0	0.0	0.0	#N/A	SVE Off
DPE-06	7/11/2018	14:10	0	0.0	7.0	1.0	SVE Off
DPE-06	7/19/2018	15:00	0	0.0	6.0	#N/A	SVE Off
DPE-06	7/26/2018	16:00	0	0.0	8.0	#N/A	SVE Off
DPE-06	8/3/2018	15:30	0	0.0	8.0	#N/A	SVE Off
DPE-06	8/7/2018	12:30	0	0.0	8.5	#N/A	SVE Off
DPE-06	8/15/2018	14:30	0	0.0	8.0	#N/A	SVE Off
DPE-06	10/10/2018	17:10	0	0.0	0.0	#N/A	SVE Off
DPE-06	10/18/2018	16:00	100	4.0	9.0	2.7	
DPE-06	10/26/2018	16:30	100	4.0	8.5	2.8	
DPE-06	11/7/2018	16:30	100	5.5	13.0	1.2	
DPE-06	11/13/2018	14:00	100	3.0	7.5	0.7	
DPE-06	11/21/2018	14:20	100	4.0	7.0	1.1	

**Table 4-5**  
**Dual Phase Extraction Well Vapor Data**  
**Former Unocal Edmonds Bulk Fuel Terminal**  
**11720 Unoco Road**  
**Edmonds, Washington**

DPE-07							
DPE Well ID	Date	Time	Manifold SVE Valve Position	Wellhead Vacuum	Manifold Vacuum	VOCs Concentration <sup>2</sup> .	Comments
	mm/dd/yy	hh:mm <sup>1</sup> .	% open	in Hg	in Hg	ppmv	
DPE-07	12/13/2017	10:15	100	9.0	8.5	740.2	
DPE-07	12/13/2017	14:35	100	9.0	8.5	1006.0	
DPE-07	12/14/2017	12:00	100	9.5	8.0	658.8	
DPE-07	12/20/2017	13:30	100	11.0	14.0	#N/A	Water in line
DPE-07	12/27/2017	13:40	100	9.5	12	274.2	
DPE-07	1/5/2018	16:45	100	11	12	236.2	
DPE-07	1/9/2018	17:00	100	5.5	2.5	207.0	
DPE-07	1/18/2018	14:50	100	5.5	7.0	32.8	
DPE-07	1/25/2018	9:00	50	4.5	4.5	18.9	
DPE-07	2/1/2018	11:00	80	6.5	7.5	9.2	
DPE-07	2/8/2018	10:20	100	6.0	6.0	12.7	
DPE-07	2/16/2018	13:15	100	13.0	13.0	42.6	
DPE-07	2/20/2018	14:30	100	6.0	3.0	32.1	
DPE-07	2/28/2018	14:30	100	6.5	9.0	11.3	
DPE-07	3/8/2018	12:00	0	0.0	0.0	#N/A	SVE off
DPE-07	3/14/2018	12:30	0	0.0	0.0	#N/A	SVE off
DPE-07	5/8/2018	14:10	100	5.0	13.5	#N/A	Water in line
DPE-07	5/17/2018	16:45	0	0.0	8.0	#N/A	SVE off
DPE-07	5/23/2018	16:25	0	0.0	7.0	#N/A	SVE off
DPE-07	5/29/2018	17:00	100	8.0	10.0	#N/A	
DPE-07	6/7/2018	16:45	100	9.0	21.0	39.0	
DPE-07	6/15/2018	14:00	100	5.5	12.5	12.0	
DPE-07	7/5/2018	13:00	0	0.0	0.0	#N/A	SVE off
DPE-07	7/11/2018	14:10	0	0.0	10.0	0.0	SVE off
DPE-07	7/19/2018	15:00	0	0.0	7.0	#N/A	SVE off
DPE-07	7/26/2018	16:00	0	0.0	12.0	#N/A	SVE off
DPE-07	8/3/2018	15:30	0	0.0	9.0	#N/A	SVE off
DPE-07	8/7/2018	12:30	0	0.0	9.5	#N/A	SVE off
DPE-07	8/15/2018	14:30	0	0.0	11.0	#N/A	SVE off
DPE-07	10/10/2018	17:10	0	0.0	0.0	#N/A	SVE off
DPE-07	10/18/2018	16:00	100	0.0	11.0	194.6	
DPE-07	10/26/2018	16:30	100	0.0	10.0	185.6	
DPE-07	11/7/2018	16:30	100	7.0	15.0	226.9	
DPE-07	11/13/2018	14:00	100	5.0	10.0	45.0	
DPE-07	11/21/2018	14:20	100	5.0	10.5	42.6	

**Table 4-5**  
**Dual Phase Extraction Well Vapor Data**  
**Former Unocal Edmonds Bulk Fuel Terminal**  
**11720 Unoco Road**  
**Edmonds, Washington**

DPE-08							
DPE Well ID	Date	Time	Manifold SVE Valve Position	Wellhead Vacuum	Manifold Vacuum	VOCs Concentration <sup>2</sup> .	Comments
	mm/dd/yy	hh:mm <sup>1</sup> .	% open	in Hg	in Hg	ppmv	
DPE-08	12/13/2017	10:15	0	0.0	0.0	#N/A	SVE off
DPE-08	12/13/2017	14:35	0	0.0	0.0	#N/A	SVE off
DPE-08	12/14/2017	12:00	0	0.0	0.0	#N/A	SVE off
DPE-08	12/20/2017	13:30	0	0.0	4.0	#N/A	SVE off
DPE-08	12/27/2017	13:40	0	0.0	4.0	#N/A	SVE off
DPE-08	1/5/2018	16:45	0	0.0	3.0	#N/A	SVE off
DPE-08	1/9/2018	17:00	0	0.0	4.5	#N/A	SVE off
DPE-08	1/18/2018	14:50	0	0.0	0.0	#N/A	SVE off
DPE-08	1/25/2018	9:00	50	4.5	4.5	1.4	
DPE-08	2/1/2018	11:00	50	1.0	4.5	1.5	
DPE-08	2/8/2018	10:20	0	0.0	0.0	#N/A	SVE off
DPE-08	2/16/2018	13:15	0	0.0	0.0	#N/A	SVE off
DPE-08	2/20/2018	14:30	0	0.0	0.0	#N/A	SVE off
DPE-08	2/28/2018	14:30	50	3.0	7.0	1.6	
DPE-08	3/8/2018	12:00	0	0.0	0.0	#N/A	SVE off
DPE-08	3/14/2018	12:30	0	0.0	0.0	#N/A	SVE off
DPE-08	5/8/2018	14:10	100	--	11	0.0	
DPE-08	5/17/2018	16:45	0	0.0	6.5	#N/A	SVE off
DPE-08	5/23/2018	16:25	0	0.0	7.0	#N/A	SVE off
DPE-08	5/29/2018	17:00	0	0.0	8.0	#N/A	SVE off
DPE-08	6/7/2018	16:45	0	0.0	8.0	#N/A	SVE off
DPE-08	6/15/2018	14:00	0	0.0	8.0	#N/A	SVE off
DPE-08	7/5/2018	13:00	0	0.0	0.0	#N/A	SVE off
DPE-08	7/11/2018	14:10	0	0.0	8.0	#N/A	SVE off
DPE-08	7/19/2018	15:00	0	0.0	0.0	#N/A	SVE off
DPE-08	7/26/2018	16:00	0	0.0	10.0	#N/A	SVE off
DPE-08	8/3/2018	15:30	0	0.0	8.0	#N/A	SVE off
DPE-08	8/7/2018	12:30	0	0.0	8.0	#N/A	SVE off
DPE-08	8/15/2018	14:30	0	0.0	9.0	#N/A	SVE off
DPE-08	10/10/2018	17:10	0	0.0	7.5	#N/A	SVE off
DPE-08	10/18/2018	16:00	0	0.0	7.0	#N/A	SVE off
DPE-08	10/26/2018	16:30	0	0.0	8.0	#N/A	SVE off
DPE-08	11/7/2018	16:30	0	0.0	5.0	#N/A	SVE off
DPE-08	11/13/2018	14:00	100	4.0	8.5	1.6	
DPE-08	11/21/2018	14:20	0	0.0	4.5	#N/A	SVE off

**Table 4-5**  
**Dual Phase Extraction Well Vapor Data**  
**Former Unocal Edmonds Bulk Fuel Terminal**  
**11720 Unoco Road**  
**Edmonds, Washington**

DPE-09							
DPE Well ID	Date	Time	Manifold SVE Valve Position	Wellhead Vacuum	Manifold Vacuum	VOCs Concentration <sup>2</sup> .	Comments
	mm/dd/yy	hh:mm <sup>1</sup> .	% open	in Hg	in Hg	ppmv	
DPE-09	12/13/2017	10:15	0	0.0	0.0	#N/A	SVE off
DPE-09	12/13/2017	14:35	0	0.0	0.0	#N/A	SVE off
DPE-09	12/14/2017	12:00	0	0.0	0.0	#N/A	SVE off
DPE-09	12/20/2017	13:30	0	0.0	0.5	#N/A	SVE off
DPE-09	12/27/2017	13:40	0	0.0	0.5	#N/A	SVE off
DPE-09	1/5/2018	16:45	0	0.0	0.5	#N/A	SVE off
DPE-09	1/9/2018	17:00	0	0.0	0.0	#N/A	SVE off
DPE-09	1/18/2018	14:50	0	0.0	0.0	#N/A	SVE off
DPE-09	1/25/2018	9:00	40	2.0	4.5	44.6	
DPE-09	2/1/2018	11:00	40	3.5	4.0	18.6	
DPE-09	2/8/2018	10:20	0	0.0	0.0	#N/A	SVE off
DPE-09	2/16/2018	13:15	0	0.0	0.0	#N/A	SVE off
DPE-09	2/20/2018	14:30	0	0.0	0.0	#N/A	SVE off
DPE-09	2/28/2018	14:30	0	0.0	0.0	#N/A	SVE off
DPE-09	3/8/2018	12:00	0	0.0	0.0	#N/A	SVE off
DPE-09	3/14/2018	12:30	0	0.0	0.0	#N/A	SVE off
DPE-09	5/8/2018	14:10	100	0.0	1.5	0.8	
DPE-09	5/17/2018	16:45	0	0.0	0.0	#N/A	SVE off
DPE-09	5/23/2018	16:25	0	0.0	0.0	#N/A	SVE off
DPE-09	5/29/2018	17:00	0	0.0	0.0	#N/A	SVE off
DPE-09	6/7/2018	16:45	0	0.0	0.0	#N/A	SVE off
DPE-09	6/15/2018	14:00	0	0.0	0.5	#N/A	SVE off
DPE-09	7/5/2018	13:00	0	0.0	0.0	#N/A	SVE off
DPE-09	7/11/2018	14:10	0	0.0	0.0	#N/A	SVE off
DPE-09	7/19/2018	15:00	0	0.0	0.0	#N/A	SVE off
DPE-09	7/26/2018	16:00	0	0.0	2.0	#N/A	SVE off
DPE-09	8/3/2018	15:30	0	0.0	1.0	#N/A	SVE off
DPE-09	8/7/2018	12:30	0	0.0	1.0	#N/A	SVE off
DPE-09	8/15/2018	14:30	0	0.0	2.0	#N/A	SVE off
DPE-09	10/10/2018	17:10	0	0.0	0.0	#N/A	SVE off
DPE-09	10/18/2018	16:00	0	0.0	0.0	#N/A	SVE off
DPE-09	10/26/2018	16:30	0	0.0	0.0	#N/A	SVE off
DPE-09	11/7/2018	16:30	0	0.0	0.0	#N/A	SVE off
DPE-09	11/13/2018	14:00	100	1.0	1.0	3.2	
DPE-09	11/21/2018	14:20	0	0.0	0.0	#N/A	SVE off

**Table 4-5**  
**Dual Phase Extraction Well Vapor Data**  
**Former Unocal Edmonds Bulk Fuel Terminal**  
**11720 Unoco Road**  
**Edmonds, Washington**

DPE-10							
DPE Well ID	Date	Time	Manifold SVE Valve Position	Wellhead Vacuum	Manifold Vacuum	VOCs Concentration <sup>2</sup> .	Comments
	mm/dd/yy	hh:mm <sup>1</sup> .	% open	in Hg	in Hg	ppmv	
DPE-10	12/13/2017	10:15	100	7.0	6.5	98.5	
DPE-10	12/13/2017	14:35	100	7.0	6.5	79.3	
DPE-10	12/14/2017	12:00	100	7.0	7.0	82.1	
DPE-10	12/20/2017	13:30	100	8.5	9.0	#N/A	Water in line
DPE-10	12/27/2017	13:40	100	8	8	39.2	
DPE-10	1/5/2018	16:45	100	7.5	8	#N/A	Water in line
DPE-10	1/9/2018	17:00	100	4.5	3	44.8	
DPE-10	1/18/2018	14:50	100	5.0	5.0	16.8	
DPE-10	1/25/2018	9:00	50	5.0	5.0	18.7	
DPE-10	2/1/2018	11:00	50	4.0	4.0	7.0	
DPE-10	2/8/2018	10:20	0	0.0	0.0	#N/A	SVE off
DPE-10	2/16/2018	13:15	0	0.0	0.0	#N/A	SVE off
DPE-10	2/20/2018	14:30	0	0.0	0.0	#N/A	SVE off
DPE-10	2/28/2018	14:30	0	0.0	0.0	#N/A	SVE off
DPE-10	3/8/2018	12:00	0	0.0	0.0	#N/A	SVE off
DPE-10	3/14/2018	12:30	0	0.0	0.0	#N/A	SVE off
DPE-10	5/8/2018	14:10	100	4.0	9.5	0.3	
DPE-10	5/17/2018	16:45	0	0.0	0.0	#N/A	SVE off
DPE-10	5/23/2018	16:25	0	0.0	0.0	#N/A	SVE off
DPE-10	5/29/2018	17:00	0	0.0	0.0	#N/A	SVE off
DPE-10	6/7/2018	16:45	0	0.0	0.0	#N/A	SVE off
DPE-10	6/15/2018	14:00	0	0.0	0.0	#N/A	SVE off
DPE-10	7/5/2018	13:00	0	0.0	0.0	#N/A	SVE off
DPE-10	7/11/2018	14:10	0	0.0	0.0	#N/A	SVE off
DPE-10	7/19/2018	15:00	0	0.0	0.0	#N/A	SVE off
DPE-10	7/26/2018	16:00	0	0.0	2.0	#N/A	SVE off
DPE-10	8/3/2018	15:30	0	0.0	1.0	#N/A	SVE off
DPE-10	8/7/2018	12:30	0	0.0	0.5	#N/A	SVE off
DPE-10	8/15/2018	14:30	0	0.0	2.0	#N/A	SVE off
DPE-10	10/10/2018	17:10	0	0.0	0.0	#N/A	SVE off
DPE-10	10/18/2018	16:00	0	0.0	0.0	#N/A	SVE off
DPE-10	10/26/2018	16:30	0	0.0	0.0	#N/A	SVE off
DPE-10	11/7/2018	16:30	0	0.0	0.0	#N/A	SVE off
DPE-10	11/13/2018	14:00	100	2.0	2.0	1.1	
DPE-10	11/21/2018	14:20	0	0.0	0.0	#N/A	SVE off

**Table 4-5**  
**Dual Phase Extraction Well Vapor Data**  
**Former Unocal Edmonds Bulk Fuel Terminal**  
**11720 Unoco Road**  
**Edmonds, Washington**

DPE-11							
DPE Well ID	Date	Time	Manifold SVE Valve Position	Wellhead Vacuum	Manifold Vacuum	VOCs Concentration <sup>2</sup> .	Comments
	mm/dd/yy	hh:mm <sup>1</sup> .	% open	in Hg	in Hg	ppmv	
DPE-11	12/13/2017	10:15	100	9.0	7.0	#N/A	Water in line
DPE-11	12/13/2017	14:35	100	9.0	7.5	#N/A	Water in line
DPE-11	12/14/2017	12:00	100	9.0	8.5	#N/A	Water in line
DPE-11	12/20/2017	13:30	100	10.5	12.0	#N/A	Water in line
DPE-11	12/27/2017	13:40	100	8.5	9.5	#N/A	Water in line
DPE-11	1/5/2018	16:45	100	9	10	#N/A	Water in line
DPE-11	1/9/2018	17:00	100	5.5	5	326.5	
DPE-11	1/18/2018	14:50	100	5.0	5.0	#N/A	Water in line
DPE-11	1/25/2018	9:00	40	4.5	5.0	96.9	
DPE-11	2/1/2018	11:00	40	3.5	5.0	71.8	
DPE-11	2/8/2018	10:20	0	0.0	0.0	#N/A	SVE off
DPE-11	2/16/2018	13:15	0	0.0	0.0	#N/A	SVE off
DPE-11	2/20/2018	14:30	0	0.0	0.0	#N/A	SVE off
DPE-11	2/28/2018	14:30	0	0.0	0.0	#N/A	SVE off
DPE-11	3/8/2018	12:00	0	0.0	0.0	#N/A	SVE off
DPE-11	3/14/2018	12:30	0	0.0	0.0	#N/A	SVE off
DPE-11	5/8/2018	14:10	100	4.0	10.0	#N/A	Water in line
DPE-11	5/17/2018	16:45	100	7.0	12.0	1.0	
DPE-11	5/23/2018	16:25	100	9.0	14.0	1.2	
DPE-11	5/29/2018	17:00	100	7.5	12.5	#N/A	Water in line
DPE-11	6/7/2018	16:45	0	0.0	6.0	#N/A	SVE off
DPE-11	6/15/2018	14:00	80	6.0	10.0	198.0	
DPE-11	7/5/2018	13:00	100	9.5	17.5	#NA	Water in line
DPE-11	7/11/2018	14:10	100	4.0	12.0	81.0	
DPE-11	7/19/2018	15:00	100	4.0	12.0	86.0	
DPE-11	7/26/2018	16:00	100	5.0	14.0	80.0	
DPE-11	8/3/2018	15:30	100	5.0	15.0	125.0	
DPE-11	8/7/2018	12:30	100	9.0	15.0	86.0	
DPE-11	8/15/2018	14:30	100	9.5	16.0	80.0	
DPE-11	10/10/2018	17:10	0	0.0	3.5	#N/A	SVE off
DPE-11	10/18/2018	16:00	0	0.0	4.0	#N/A	SVE off
DPE-11	10/26/2018	16:30	0	0.0	4.0	#N/A	SVE off
DPE-11	11/7/2018	16:30	100	6.0	9.0	#N/A	Water in line
DPE-11	11/13/2018	14:00	100	4.0	9.0	23.0	
DPE-11	11/21/2018	14:20	100	4.0	5.5	21.3	



**Table 4-5**  
**Dual Phase Extraction Well Vapor Data**  
**Former Unocal Edmonds Bulk Fuel Terminal**  
**11720 Unoco Road**  
**Edmonds, Washington**

DPE-12 / DPE-12-R							
DPE Well ID	Date	Time	Manifold SVE Valve Position	Wellhead Vacuum	Manifold Vacuum	VOCs Concentration <sup>2</sup> .	Comments
	mm/dd/yy	hh:mm <sup>1</sup> .	% open	in Hg	in Hg	ppmv	
DPE-12	12/13/2017	10:15	0	0.0	0.0	#N/A	SVE off
DPE-12	12/13/2017	14:35	0	0.0	0.0	#N/A	SVE off
DPE-12	12/14/2017	12:00	0	0.0	0.0	#N/A	SVE off
DPE-12	12/20/2017	13:30	0	0.0	0.0	#N/A	SVE off
DPE-12	12/27/2017	13:40	0	0.0	0.0	#N/A	SVE off
DPE-12	1/5/2018	16:45	0	0.0	0.0	#N/A	SVE off
DPE-12	1/9/2018	17:00	0	0.0	0.0	#N/A	SVE off
DPE-12	1/18/2018	14:50	0	0.0	0.0	#N/A	SVE off
DPE-12	1/25/2018	9:00	0	0.0	0.0	#N/A	SVE off
DPE-12	2/1/2018	11:00	0	0.0	0.0	#N/A	SVE off
DPE-12	2/8/2018	10:20	0	0.0	0.0	#N/A	SVE off
DPE-12	2/16/2018	13:15	0	0.0	0.0	#N/A	SVE off
DPE-12	2/20/2018	14:30	0	0.0	0.0	#N/A	SVE off
DPE-12	2/28/2018	14:30	0	0.0	0.0	#N/A	SVE off
DPE-12	3/8/2018	12:00	0	0.0	0.0	#N/A	SVE off
DPE-12	3/14/2018	12:30	0	0.0	0.0	#N/A	SVE off
DPE-12-R <sup>5</sup> .	5/8/2018	14:10	100	3.5	10.5	5.5	
DPE-12-R	5/17/2018	16:45	100	4.0	10.5	2.3	
DPE-12-R	5/23/2018	16:25	100	10.0	15.0	7.2	
DPE-12-R	5/29/2018	17:00	100	5.0	11.0	3.9	
DPE-12-R	6/7/2018	16:45	0	0.0	6.5	#N/A	SVE off
DPE-12-R	6/15/2018	14:00	100	6.5	10.5	5.0	
DPE-12-R	7/5/2018	13:00	100	5.0	17.5	2.0	
DPE-12-R	7/11/2018	14:10	100	0.0	13.0	3.0	
DPE-12-R	7/19/2018	15:00	100	5.5	13.0	7.0	
DPE-12-R	7/26/2018	16:00	100	7.0	15.5	6.0	
DPE-12-R	8/3/2018	15:30	100	7.5	15.0	8.0	
DPE-12-R	8/7/2018	12:30	100	5.0	15.0	8.0	
DPE-12-R	8/15/2018	14:30	100	5.5	16.0	7.0	
DPE-12-R	10/10/2018	17:10	0	0.0	0.0	#N/A	SVE off
DPE-12-R	10/18/2018	16:00	0	0.0	6.0	#N/A	SVE off
DPE-12-R	10/26/2018	16:30	0	0.0	0.0	#N/A	SVE off
DPE-12-R	11/7/2018	16:30	100	4.5	10.0	2.4	
DPE-12-R	11/13/2018	14:00	100	3.0	8.0	2.3	
DPE-12-R	11/21/2018	14:20	100	3.0	8.0	2.3	

**Table 4-5**  
**Dual Phase Extraction Well Vapor Data**  
**Former Unocal Edmonds Bulk Fuel Terminal**  
**11720 Unoco Road**  
**Edmonds, Washington**

DPE-13 <sup>3</sup>								
DPE Well ID	Date	Time	Manifold SVE Valve Position	DPE-13 Wellhead Vacuum	SVE-1 Wellhead Vacuum	Manifold Vacuum	VOCs Concentration <sup>2</sup>	Comments
	mm/dd/yy	hh:mm <sup>1</sup>	% open	in Hg	in Hg	in Hg	ppmv	
DPE-13	12/13/2017	10:15	100	8.0	#N/A	5.5	#N/A	Water in line
DPE-13	12/13/2017	14:35	100	8.0	#N/A	6.0	#N/A	Water in line
DPE-13	12/14/2017	12:00	100	9.0	#N/A	7.5	60.9	
DPE-13	12/20/2017	13:30	100	10.0	7.0	11.0	40.1	
DPE-13	12/27/2017	13:40	100	8.5	6.0	9.0	30.7	
DPE-13	1/5/2018	16:45	100	8.0	5.5	8.0	#N/A	Water in line
DPE-13	1/9/2018	17:00	100	4.5	5.0	3.0	49.7	
DPE-13	1/18/2018	14:50	100	5.0	5.0	5.5	8.2	
DPE-13	1/25/2018	9:00	40	2.5	7.0	4.5	23.0	
DPE-13	2/1/2018	11:00	40	1.0	4.5	4.5	13.6	
DPE-13	2/8/2018	10:20	0	0.0	0.0	0.0	#N/A	SVE off
DPE-13	2/16/2018	13:15	0	0.0	0.0	0.0	#N/A	SVE off
DPE-13	2/20/2018	14:30	0	0.0	0.0	0.0	#N/A	SVE off
DPE-13	2/28/2018	14:30	0	0.0	0.0	0.0	#N/A	SVE off
DPE-13	3/8/2018	12:00	0	0.0	0.0	0.0	#N/A	SVE off
DPE-13	3/14/2018	12:30	0	0.0	0.0	0.0	#N/A	SVE off
DPE-13	5/8/2018	14:10	100	6.0	5.0	10.0	3.9	
DPE-13	5/17/2018	16:45	100	8.0	6.0	12.0	1.40	
DPE-13	5/23/2018	16:25	100	10.0	6.5	16.0	15.80	
DPE-13	5/29/2018	17:00	100	8.0	6.0	13.0	7.80	
DPE-13	6/7/2018	16:45	0	0.0	0.0	7.5	#N/A	SVE off
DPE-13	6/15/2018	14:00	100	7.0	5.5	12.5	24.0	
DPE-13	7/5/2018	13:00	100	6.0	7.0	18.5	#N/A	Water in line
DPE-13	7/11/2018	14:10	100	7.0	5.5	15.0	6.0	
DPE-13	7/19/2018	15:00	100	5.0	5.5	13.0	9.0	
DPE-13	7/26/2018	16:00	100	7.0	6.0	17.0	11.0	
DPE-13	8/3/2018	15:30	100	7.0	6.0	18.0	7.0	
DPE-13	8/7/2018	12:30	100	6.5	7.0	18.0	5.0	
DPE-13	8/15/2018	14:30	100	8.0	6.0	19.0	8.0	
DPE-13	10/10/2018	17:10	0	0.0	0.0	0.0	#N/A	SVE Off
DPE-13	10/18/2018	16:00	0	0.0	0.0	8.0	#N/A	SVE Off
DPE-13	10/26/2018	16:30	0	0.0	5.0	5.0	#N/A	SVE Off
DPE-13	11/7/2018	16:30	0	0.0	0.0	4.5	#N/A	SVE Off
DPE-13	11/13/2018	14:00	100	4.0	0.0	5.0	#N/A	Water in line
DPE-13	11/21/2018	14:20	0	0.0	0.0	4.0	#N/A	SVE Off

**Table 4-5**  
**Dual Phase Extraction Well Vapor Data**  
**Former Unocal Edmonds Bulk Fuel Terminal**  
**11720 Unoco Road**  
**Edmonds, Washington**

DPE-14 <sup>4</sup>								
DPE Well ID	Date	Time	Manifold SVE Valve Position	DPE-14 Wellhead Vacuum	SVE-2 Wellhead Vacuum	Manifold Vacuum	VOCs Concentration <sup>2</sup>	Comments
	mm/dd/yy	hh:mm <sup>1</sup>	% open	in Hg	in Hg	in Hg	ppmv	
DPE-14	12/13/2017	10:15	100	9.0	#N/A	7.0	#N/A	Water in line
DPE-14	12/13/2017	14:35	100	8.5	#N/A	7.5	#N/A	Water in line
DPE-14	12/14/2017	12:00	100	8.0	#N/A	8.0	41.3	
DPE-14	12/20/2017	13:30	100	10.0	5.0	12.0	49.1	
DPE-14	12/27/2017	13:40	100	8.0	6.0	9.0	39.6	
DPE-14	1/5/2018	16:45	100	9.5	6.0	10.5	21.7	
DPE-14	1/9/2018	17:00	100	5.0	2.5	4.5	39.3	
DPE-14	1/18/2018	14:50	100	5.0	4.0	7.0	24.3	
DPE-14	1/25/2018	9:00	100	7.0	5.0	7.0	20.3	
DPE-14	2/1/2018	11:00	100	5.0	4.0	6.5	#N/A	Water in line
DPE-14	2/8/2018	10:20	0	0.0	0.0	0.0	#N/A	SVE off
DPE-14	2/16/2018	13:15	0	0.0	0.0	0.0	#N/A	SVE off
DPE-14	2/20/2018	14:30	0	0.0	0.0	0.0	#N/A	SVE off
DPE-14	2/28/2018	14:30	0	0.0	0.0	0.0	#N/A	SVE off
DPE-14	3/8/2018	12:00	0	0.0	0.0	0.0	#N/A	SVE off
DPE-14	3/14/2018	12:30	0	0.0	0.0	0.0	#N/A	SVE off
DPE-14	5/8/2018	14:10	100	4.0	4.0	12.5	#N/A	Water in line
DPE-14	5/17/2018	16:45	100	5.0	4.5	12.0	4.2	
DPE-14	5/23/2018	16:25	100	9.0	5.5	16.0	9.8	
DPE-14	5/29/2018	17:00	100	6.5	6.0	13.0	15.0	
DPE-14	6/7/2018	16:45	0	0.0	0.0	6.5	#N/A	SVE off
DPE-14	6/15/2018	14:00	100	6.0	6.0	11.0	18.0	
DPE-14	7/5/2018	13:00	100	6.5	7.0	18.0	17.0	
DPE-14	7/11/2018	14:10	100	5.0	5.0	14.0	11.0	
DPE-14	7/19/2018	15:00	100	5.0	5.0	11.5	11.0	
DPE-14	7/26/2018	16:00	100	6.0	5.5	16.0	9.0	
DPE-14	8/3/2018	15:30	100	6.0	5.0	16.0	8.0	
DPE-14	8/7/2018	12:30	100	8.0	7.0	16.0	8.0	
DPE-14	8/15/2018	14:30	100	8.0	6.0	16.5	9.0	
DPE-14	10/10/2018	17:10	0	0.0	0.0	0.0	#N/A	SVE Off
DPE-14	10/18/2018	16:00	0	0.0	0.0	7.0	#N/A	SVE Off
DPE-14	10/26/2018	16:30	0	0.0	0.0	6.0	#N/A	SVE Off
DPE-14	11/7/2018	16:30	0	0.0	0.0	6.0	#N/A	SVE Off
DPE-14	11/13/2018	14:00	100	4.0	0.0	7.5	1.0	
DPE-14	11/21/2018	14:20	0	0.0	0.0	6.5	#N/A	SVE Off

**Notes**  
**Former Unocal Edmonds Bulk Fuel Terminal**  
**11720 Unoco Road**  
**Edmonds, Washington**

<b>Table 4-5</b> <b>Dual-Phase</b> <b>Extraction Well</b> <b>Vapor Data</b>	<p>1. hh:mm in data sheets is reported in 24 hour format</p> <p>2. VOCs concentration measured in the field by photoionization detector (PID) reading</p> <p>3. SVE well SVE -2 is connected to the individual vapor conveyance line for DPE-13.</p> <p>4. SVE well SVE -1 is connected to the individual vapor conveyance line for DPE-14.</p> <p>5. DPE-12 was decommissioned and DPE-12R was installed approximately four feet to the west on 03/22/18.</p> <p>DPE well = dual phase extraction well; remediation well used for both groundwater and soil vapor extraction</p> <p>in Hg = inches mercury</p> <p>ppmv = parts per million vapor</p> <p>#N/A = not applicable, not available</p> <p>SVE = soil vapor extraction</p>
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Table 4-6  
 Observation Well Data  
 Former Unocal Edmonds Bulk Fuel Terminal  
 11720 Unoco Road  
 Edmonds, Washington

Well ID	Casing Elevation	Date	Time	Induced Vacuum	Closest DPE Well	Distance to DPE Well	Depth to Water	Groundwater Elevation	Drawdown <sup>2,3</sup>	Comments
	ft NAVD88	mm/dd/yy	hh:mm <sup>1</sup>	in H <sub>2</sub> O	DPE-X	feet	ft btoc	ft NAVD88	ft bbl	Notes
MW-526	12.90	12/14/2017	13:02	116.6	DPE-11	10	5.97	6.93	0.94	
MW-526	12.90	12/20/2017	14:36	127.4	DPE-11	10	6.12	6.78	1.09	
MW-526	12.90	12/27/2017	12:10	41.2	DPE-11	10	6.18	6.72	1.15	
MW-526	12.90	1/5/2018	15:20	24.4	DPE-11	10	6.04	6.86	1.01	
MW-526	12.90	1/9/2018	10:45	114.8	DPE-11	10	6.15	6.75	1.12	
MW-526	12.90	1/18/2018	13:05	12.9	DPE-11	10	6.00	6.90	0.97	
MW-526	12.90	1/24/2018	14:08	127.1	DPE-11	10	6.18	6.72	1.15	
MW-526	12.90	2/1/2018	9:05	24.7	DPE-11	10	5.99	6.91	0.96	
MW-526	12.90	2/8/2018	8:30	0.0	DPE-11	10	5.42	7.48	0.39	DPE-11 off
MW-526	12.90	2/13/2018	14:40	#N/A	DPE-11	10	5.52	7.38	0.49	SVE off
MW-526	12.90	2/20/2018	14:15	0.0	DPE-11	10	5.80	7.10	0.77	
MW-526	12.90	2/28/2018	15:10	0.0	DPE-11	10	5.80	7.1	0.77	DPE-11 off
MW-526	12.90	3/8/2018	14:15	0.0	DPE-11	10	5.60	7.3	0.57	DPE-11 off
MW-526	12.90	3/14/2018	14:17	0.0	DPE-11	10	5.53	7.37	0.50	DPE-11 off
MW-526	12.90	5/29/2018	14:17	139.8	DPE-11	10	6.42	6.48	1.39	
MW-526	12.90	6/18/2018	15:15	0.0	DPE-11	10	6.19	6.71	1.16	SVE off
MW-526	12.90	7/19/2018	16:13	74.8	DPE-11	10	6.61	6.29	1.58	
MW-526	12.90	8/7/2018	10:53	148.7	DPE-11	10	7.40	5.5	2.37	DPE/SVE Wells 11 to 14 and SVE-1 and SVE-2 on only
MW-526	12.90	10/26/2018	14:53	166.6	DPE-11	10	5.85	7.05	0.82	
MW-526	12.90	11/13/2018	15:25	14.7	DPE-11	10	6.23	6.67	1.20	
MW-531	13.26	11/28/2017	9:00	#N/A	DPE-5	30	6.74	6.52	#N/A	DPE system baseline event before system startup - System off
MW-531	13.26	11/30/2017	15:34	#N/A	DPE-5	30	6.64	6.62	-0.10	DPE system testing
MW-531	13.26	12/1/2017	15:45	#N/A	DPE-5	30	6.76	6.50	0.02	DPE system startup (groundwater extraction only)
MW-531	13.26	12/5/2017	13:15	#N/A	DPE-5	30	7.40	5.86	0.66	
MW-531	13.26	12/13/2017	11:53	28.3	DPE-5	30	7.99	5.27	1.25	
MW-531	13.26	12/13/2017	15:54	29.2	DPE-5	30	7.97	5.29	1.23	
MW-531	13.26	12/14/2017	14:30	26.7	DPE-5	30	8.04	5.22	1.30	
MW-531	13.26	12/20/2017	15:18	50.2	DPE-5	30	7.36	5.90	0.62	
MW-531	13.26	12/27/2017	#N/A	#N/A	DPE-5	30	#N/A	#N/A	#N/A	Not Gauged
MW-531	13.26	1/5/2018	15:54	50.7	DPE-5	30	7.54	5.72	0.80	
MW-531	13.26	1/9/2018	15:33	35.1	DPE-5	30	6.89	6.37	0.15	
MW-531	13.26	1/18/2018	13:43	33.9	DPE-5	30	6.72	6.54	-0.02	
MW-531	13.26	1/24/2018	14:49	47.5	DPE-5	30	6.49	6.77	-0.25	
MW-531	13.26	2/1/2018	9:50	24.5	DPE-5	30	7.10	6.16	0.36	
MW-531	13.26	2/8/2018	9:29	30.0	DPE-5	30	7.40	5.86	0.66	
MW-531	13.26	2/13/2018	14:54	#N/A	DPE-5	30	7.81	5.45	1.07	SVE off
MW-531	13.26	2/20/2018	14:44	20.0	DPE-5	30	7.84	5.42	1.10	
MW-531	13.26	2/28/2018	15:50	28.2	DPE-5	30	8.10	5.16	1.36	
MW-531	13.26	3/8/2018	14:47	47.8	DPE-5	30	7.79	5.47	1.05	
MW-531	13.26	3/14/2018	14:59	46.1	DPE-5	30	7.65	5.61	0.91	
MW-531	13.26	5/29/2018	15:11	0.0	DPE-5	30	9.97	3.29	3.23	
MW-531	13.26	6/18/2018	15:01	0.0	DPE-5	30	7.93	5.33	1.19	SVE off
MW-531	13.26	7/19/2018	16:39	4.4	DPE-5	30	7.79	5.47	1.05	
MW-531	13.26	8/7/2018	11:21	0.0	DPE-5	30	7.80	5.46	1.06	DPE/SVE Wells 11 to 14 and SVE-1 and SVE-2 on only
MW-531	13.26	10/26/2018	15:16	2.7	DPE-5	30	7.69	5.57	0.95	
MW-531	13.26	11/13/2018	15:52	9.1	DPE-5	30	8.08	5.18	1.34	
MW-532	13.38	11/28/2017	9:16	#N/A	DPE-2	8	6.45	6.93	#N/A	DPE system baseline event before system startup - System off
MW-532	13.38	11/30/2017	15:49	#N/A	DPE-2	8	7.22	6.16	0.77	DPE system testing
MW-532	13.38	12/1/2017	15:54	#N/A	DPE-2	8	8.49	4.89	2.04	DPE system startup (groundwater extraction only)
MW-532	13.38	12/5/2017	13:05	#N/A	DPE-2	8	9.94	3.44	3.49	
MW-532	13.38	12/13/2017	11:44	39.0	DPE-2	8	11.36	2.02	4.91	
MW-532	13.38	12/13/2017	15:35	19.5	DPE-2	8	10.32	3.06	3.87	
MW-532	13.38	12/14/2017	14:02	20.7	DPE-2	8	10.40	2.98	3.95	
MW-532	13.38	12/20/2017	15:09	140.3	DPE-2	8	9.20	4.18	2.75	
MW-532	13.38	12/27/2017	12:25	241.4	DPE-2	8	10.03	3.35	3.58	
MW-532	13.38	1/5/2018	15:50	222.4	DPE-2	8	8.86	4.52	2.41	
MW-532	13.38	1/9/2018	15:48	121.2	DPE-2	8	8.69	4.69	2.24	
MW-532	13.38	1/18/2018	13:32	101.3	DPE-2	8	8.33	5.05	1.88	
MW-532	13.38	1/24/2018	14:32	232.5	DPE-2	8	7.85	5.53	1.40	
MW-532	13.38	2/1/2018	9:28	14.8	DPE-2	8	9.94	3.44	3.49	
MW-532	13.38	2/8/2018	9:23	24.8	DPE-2	8	9.39	3.99	2.94	
MW-532	13.38	2/13/2018	14:50	#N/A	DPE-2	8	9.55	3.83	3.10	SVE off
MW-532	13.38	2/20/2018	14:40	31.0	DPE-2	8	9.14	4.24	2.69	
MW-532	13.38	2/28/2018	15:43	14.0	DPE-2	8	9.70	3.68	3.25	
MW-532	13.38	3/8/2018	15:13	240.8	DPE-2	8	10.06	3.32	3.61	
MW-532	13.38	3/14/2018	15:06	246.2	DPE-2	8	9.62	3.76	3.17	
MW-532	13.38	5/29/2018	15:19	0.0	DPE-2	8	9.08	4.30	2.63	
MW-532	13.38	6/18/2018	14:55	0.0	DPE-2	8	9.75	3.63	3.30	SVE off
MW-532	13.38	7/19/2018	16:42	25.2	DPE-2	8	9.20	4.18	2.75	
MW-532	13.38	8/7/2018	11:27	3.5	DPE-2	8	8.30	5.08	1.85	
MW-532	13.38	10/26/2018	15:28	31.1	DPE-2	8	8.58	4.80	2.13	
MW-532	13.38	11/13/2018	15:56	3.2	DPE-2	8	9.28	4.10	2.83	

**Notes**  
**Former Unocal Edmonds Bulk Fuel Terminal**  
**11720 Unoco Road**  
**Edmonds, Washington**

Data Sheet Name	Notes
<b>Table 4-6</b> <b>Observation Well</b> <b>Data</b>	<sup>1</sup> . hh:mm in data sheets is reported in 24 hour format <sup>2</sup> . Drawdown calculation based on groundwater elevation measured during the DPE system baseline event before system startup on 11/28/17. Drawdown = groundwater elevation - baseline groundwater elevation <sup>3</sup> . Drawdown calculation based on average groundwater elevation measured from 10/20/08 to 07/24/17 for MW-519. Drawdown = groundwater elevation - average groundwater elevation DPE well = dual phase extraction well; remediation well used for both groundwater and soil vapor extraction ft bbl = feet below baseline ft btoc = feet below top of casing in Hg = inches mercury in H <sub>2</sub> O = inches water MW = monitoring well; observation well used for DPE system monitoring and groundwater compliance monitoring NAVD88 = North American Vertical Datum of 1988 SVE = soil vapor extraction PZ = piezometer; observation well used for DPE system monitoring

Table 4-7  
Catalytic Oxidizer Data  
Former Unocal Edmonds Bulk Fuel Terminal  
11720 Unoco Road  
Edmonds, Washington

Date	Time	CatOx Total Operating Hours <sup>2</sup> .	VCV Valve Opening	CatOx Inlet Temperature (Meter TT-1901)	Heater Settings CatOx Inlet Set Temperature	CatOx Outlet Temperature (Meter TT-1902)	VOCs Inlet Concentration <sup>3</sup> .	VOCs Outlet Concentration <sup>3</sup> .	Destruction Efficiency <sup>4</sup> .	Discharge Vapor Laboratory Sample
PSCAA Permit 29892 Effluent Limitations	--	--	--	> 600 °F	--	< 1,200 °F	--	--	<ul style="list-style-type: none"> <li>• 98.5% if &gt; 2,000 ppm</li> <li>• 97% if &gt; 200 ppm</li> <li>• 90% if ≥ 100 ppm</li> <li>• &lt; 10 ppm for influent &lt; 100 ppm</li> </ul>	--
mm/dd/yy	hh:mm <sup>1</sup> .	hours	% open to process	°F	°F	°F	ppmv	ppmv	%	Y/N
<b>DPE System Soil Vapor Extraction Testing: 12/05/17</b>										
<b>DPE System Soil Vapor Extraction Start-up: 12/11/17</b>										
12.13.17	12:15	57	100	624	625	714	378.80	0.5	99.9	N
12.13.17	16:12	61	100	624	625	708	364.60	0.6	99.8	N
12.14.17	10:20	79	100	624	625	688	308.20	0.1	100.0	Y
12.20.17	16:30	164	100	624	625	658	177.50	0.0	100.0	Y
12.27.17	13:20	260	100	624	625	641	129.80	0.3	99.8	Y
01.05.18	17:15	361	100	624	625	640	121.90	0.0	100.0	N
01.09.18	17:25	372	100	625	625	638	95.20	0.0	100.0	N
1/18/2018	15:05	447	100	625	625	632	44.10	0.0	100.0	N
1/25/2018	11:00	--	100	625	625	630	39.00	0.0	100.0	N
2/1/2018	11:25	684	100	626	625	630	25.90	0.0	100.0	N
2/8/2018	10:20	767	100	624	625	628	17.10	0.0	100.0	N
2/16/2018	12:45	894	100	624	625	733	172.60	0.1	99.9	N
2/20/2018	14:50	928	100	624	625	626	39.10	0.0	100.0	Y
2/28/2018	14:45	1,050	100	624	625	628	22.20	0.0	100.0	N
3/8/2018	12:35	1,164	100	625	625	629	18.10	0.0	100.0	N
3/14/2018	13:00	1,288	100	624	625	629	10.10	0.2	98.0	Y
5/8/2018	15:00	1,303	100	626	625	632	6.80	0.1	98.5	N
5/17/2018	17:00	1,477	100	624	625	629	5	0.0	100.0	Y
5/23/2018	17:15	1,624	100	625	625	633	11.1	0.0	100.0	N
5/29/2018	16:42	1,764	100	624	625	629	38.4	0.0	100.0	N
6/7/2018	17:15	1,847	100	624	625	632	26.3	0.0	100.0	N
6/15/2018	14:55	1,946	100	624	625	628	22	0.0	100.0	N
7/5/2018	14:00	2,142	100	627	625	628	17	0.0	100.0	N
7/11/2018	15:00	2,287	100	626	625	629	38	0.0	100.0	N
7/19/2018	15:20	2,303	100	627	625	625	27	0.0	100.0	N
7/26/2018	14:45	2,434	100	626	625	630	21	0.0	100.0	Y
8/3/2018	15:45	2,529	100	626	625	628	23	0.0	100.0	N
8/7/2018	13:00	2,623	100	626	625	628	22	0.0	100.0	N
8/15/2018	15:00	2,793	100	627	625	627	21	0.0	100.0	N
10/18/2018	16:15	2,797	100	625	625	625	30.1	0.0	100.0	Y
10/26/2018	16:45	2,816	100	625	625	625	10.1	0.0	100.0	N
11/7/2018	16:45	2,819	100	624	625	623	18.0	0.1	99.4	N
11/13/2018	14:25	2,922	100	626	625	620	17.5	0.0	100.0	N
11/21/2018	14:50	3,016	100	625	625	628	3.8	0.0	100.0	N

**Notes**  
**Former Unocal Edmonds Bulk Fuel Terminal**  
**11720 Unoco Road**  
**Edmonds, Washington**

Data Sheet Name	Notes
<b>Table 4-7</b> <b>Catalytic Oxidizer</b> <b>Data</b>	<sup>1</sup> . hh:mm in data sheets is reported in 24 hour format <sup>2</sup> . Catalytic Oxidizer (CatOx) total operating hours read on CatOx Panel <sup>3</sup> . VOCs concentration measured in the field by photoionization detector (PID) reading <sup>4</sup> . Destruction Efficiency = (VOCs Inlet Concentration - VOCs Outlet Concentration)*100 / VOCs Inlet Concentration °F = degrees Fahrenheit lbs/day = pounds per day PID = photoionization detector ppm = parts per million ppmv = parts per million vapor PSCAA = Puget Sound Clean Air Agency VOCs = volatile organic compounds VCV = Vapor Control Valve Y/N = yes/no > = superior than < = inferior than % = percent

**Table 4-8**  
**DPE System Treated Water Discharge**  
**Analytical Data and Field Parameters**  
**Former Unocal Terminal**  
**11720 Unoco Road**  
**Edmonds, Washington**

Sample Date	Sample Name NPDES Permit No. WA0991007 Discharge Limits	Benzene			cPAHs			Gasoline			Diesel			Heavy Oil		
		16 ug/L			0.05 ug/L			800 ug/L			500 ug/L			500 ug/L		
		ug/L	Lab Q	Val Q	ug/L	Lab Q	Val Q	ug/L	Lab Q	Val Q	ug/L	Lab Q	Val Q	ug/L	Lab Q	Val Q
12/01/17	Outfall#002	1	U	--	0.004	U, J, B, F1	U, UJ	250	U	--	24	J	--	250	U, F2	J
12/01/17	DUP-1	1	U	--	0.008	U, J, B	U, J	250	U	--	27	J	--	250	U	--
12/05/17	Outfall#002	1	U	--	0.013	U, *, J, B	U, J	250	U	--	24	J	--	250	U	--
12/14/17	Outfall#002	1	U	--	0.009	U, J, B	U, J	250	U	--	28	J	--	260	U	--
12/20/17	Outfall#002	1	U	--	0.003	U, J, B	U	250	U	--	81	J, B	U	260	U	--
12/28/17	Outfall#002	1	U	--	0.032	U	--	250	U	--	77	J, B	U	190	J	--
01/05/18	Outfall#002	1	U	--	0.003	U	--	250	U	--	100	U	--	260	U	--
01/09/18	Outfall#002	1	U	--	0.003	U	--	250	U	--	46	J, B	U	140	J, B	U
01/18/18	Outfall#002	2	U	--	0.009	U, J, B	U	250	U	--	58	J, B	U	130	J, B	U
01/24/18	Outfall#002	2	U	--	0.010	U, J, B	U	250	U	--	110	U	--	360	U	--
02/01/18	Outfall#002	2	U	--	0.003	U	--	250	U	--	110	U	--	360	U	--
02/01/18	DUP-1	2	U	--	0.003	U	--	250	U	--	110	U	--	350	U	--
02/06/18	Outfall#002	1	U	--	0.007	U, J	--	250	U	--	110	U	--	350	U	--
02/13/18	Outfall#002	1	U	--	0.003	U, J, B	U	250	U	--	110	U	--	360	U	--
02/27/18	Outfall#002	1	U	--	0.003	U	--	250	U	--	110	U	--	360	U	--
03/05/18	Outfall#002	1	U	--	0.004	U, J, B	U	250	U	--	110	U	--	360	U	--
03/14/18	Outfall#002	1	U	--	0.003	U	--	250	U	--	110	U	--	360	U	--
5/9/2018	Outfall#002	1	U	--	0.003	U	--	250	U	--	110	U, *	--	360	U	--
05/17/17	Outfall#002	1	U	--	0.003	J, B	U	250	U	--	110	U	--	350	U	--
05/23/18	Outfall#002	1	U	--	0.003	U	--	250	U	--	110	U	--	360	U	--
05/29/18	Outfall#002	1	U	--	0.004	U, J, B, F1	U, J	250	U	--	120	U	--	390	U	--
05/29/18	DUP-1	1	U	--	0.004	U, J, B	U, J	250	U	--	110	U	--	360	U	--
06/07/18	Outfall#002	2.9		--	0.003	U	--	250	U	--	120	U	--	400	U	--
06/15/18	Outfall#002	1	U	--	0.009	U, *	--	250	U	--	120	U	--	370	U	--
06/18/18	Outfall#002	1	U	--	0.009	U	--	250	U	--	110	U	--	350	U	--
06/29/18	Outfall#002	1	U	--	0.009	U, *	U	100	J	--	140	U	--	450	U	--
07/05/18	Outfall#002	1	U	--	0.009	U, *	U	250	U	--	110	U	--	360	U	--
07/11/18	Outfall#002	1	U	--	0.049	U, *	U	250	U	--	120	U	--	380	U	--
07/26/18	Outfall#002	1	U, F2	U	0.046	U, F1, *	U	250	U	--	120	U	--	380	U	--
07/26/18	DUP-1	1	U	--	0.046	U, *	U	250	U	--	120	U	--	380	U	--
08/07/18	Outfall#002	1	U	--	0.044	U, *	U	250	U	--	110	U	--	190	J	--
08/15/18	Outfall#002	1	U	--	0.009	U	--	250	U	--	120	U	--	390	U	--
08/21/18	Outfall#002	1	U	--	0.010	U	--	250	U	--	130	U	--	120	J	--
10/10/18	Outfall#002	1	U	--	0.009	U	--	250	U	--	110	U	--	350	U	--
10/18/18	Outfall#002	1	U	--	0.009	U	--	250	U	--	110	U	--	360	U	--
10/26/18	Outfall#002	1	U	--	0.009	U	--	250	U	--	130		--	360	U	--
11/07/18	Outfall#002	1	U	--	0.009	U	--	250	U	--	76	J, F1	--	360	F1	--

**Table 4-8**  
**DPE System Treated Water Discharge**  
**Analytical Data and Field Parameters**  
**Former Unocal Terminal**  
**11720 Unoco Road**  
**Edmonds, Washington**

Sample Date	Sample Name NPDES Permit No. WA0991007 Discharge Limits	Benzene			cPAHs			Gasoline			Diesel			Heavy Oil		
		16 ug/L			0.05 ug/L			800 ug/L			500 ug/L			500 ug/L		
		ug/L	Lab Q	Val Q	ug/L	Lab Q	Val Q	ug/L	Lab Q	Val Q	ug/L	Lab Q	Val Q	ug/L	Lab Q	Val Q
11/07/18	DUP-1	1	U	--	0.009	U	--	250	U	--	67	J	--	180	J	--
11/13/18	Outfall#002	1	U	--	0.044	U	--	100	U	--	250	H, B	UJ	420	H	J
11/21/18	Outfall#002	1	U	--	0.009	U	UJ	250	U	--	170	B	U	230	J	--
12/10/18	Outfall#002	1	U	--	0.044	U	--	250	U	--	110	U	--	360	U	--
12/20/18	Outfall#002	1	U	--	0.044	U	--	150	J	--	98	J	--	210	J	--
12/27/18	Outfall#002	1	U	--	0.009	U	--	250	U	--	91	J	--	120	J	--

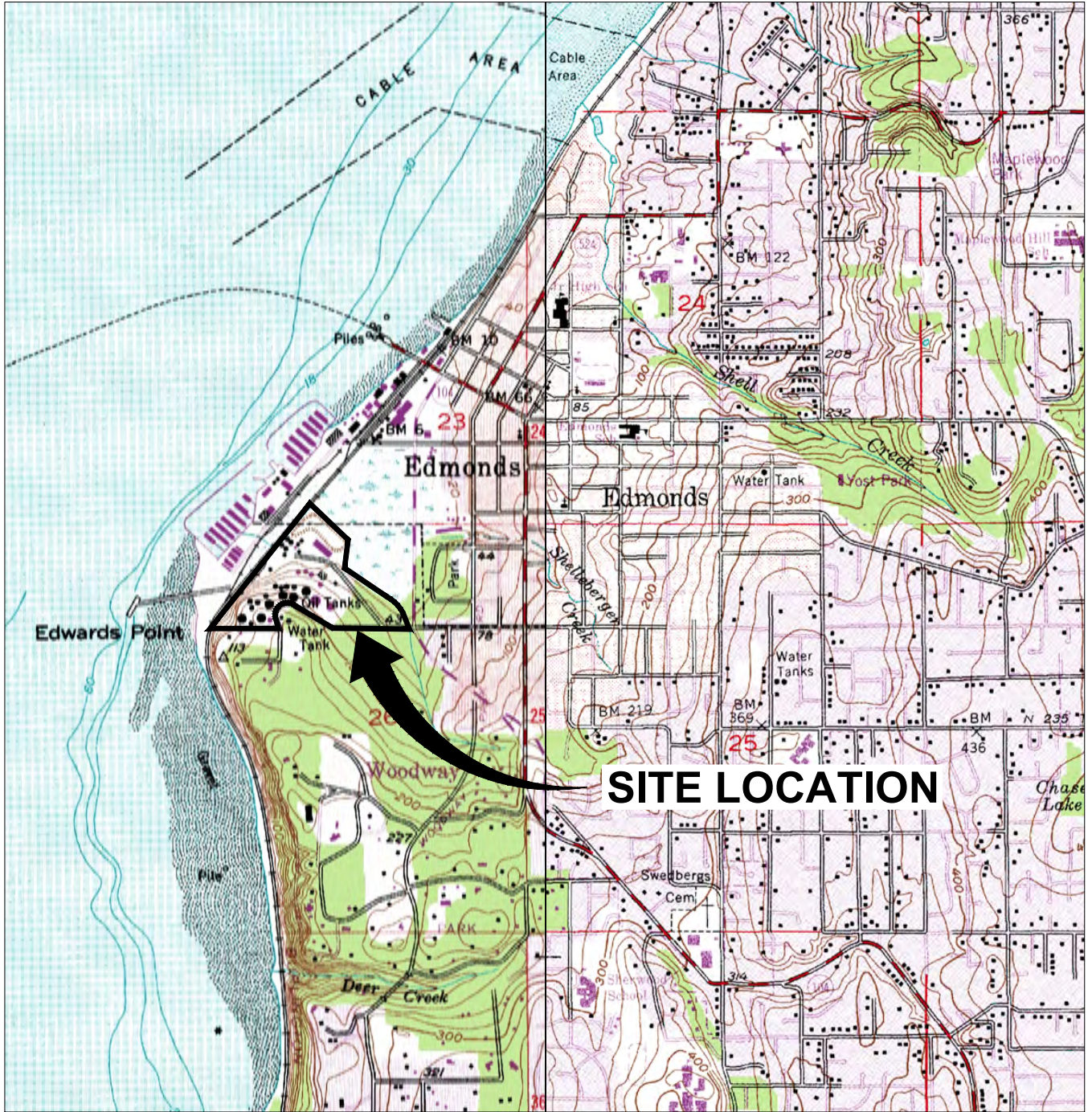
**Notes**

NPDES = National Pollutant Discharge Elimination System  
Benzene by Method United States Environmental Protection Agency (USEPA) 624  
Carcinogenic Polynuclear Aromatic Hydrocarbons (cPAHs) analyzed by USEPA Method 625. Total cPAHs calculated by summing the concentrations of benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, and indeno(1,2,3-cd)pyrene and adjusted for toxicity using toxic equivalency factors to represent a total benzo(a)pyrene concentration (WAC 173-340-900). For results which do not exceed lab. method detection limit (MDL), half of the lab. MDL is added to determine cPAHs concentration.  
Gasoline by Washington State Department of Ecology (Ecology) Method NWTPH-Gx  
Diesel and Heavy Oil by Ecology Method NWTPH-Dx (after silica gel cleanup)  
pH by pH meter onsite  
ug/L = micrograms per liter.  
Lab Q: Laboratory (lab.) qualifier  
U: Not detected at the lab. reporting limit (RL). Values shown are the lab. RLs besides for cPAHs where value shown are the lab. MDLs.  
B: Compound was found in the lab. method blank and the sample. [The sample may have been cross-contaminated at the lab.]  
J: Result is an estimate. Result is less than the lab. RL but greater than or equal to the lab. MDL and the concentration is an approximate value.  
\*: LCS or LCSD is outside acceptance limits  
F1: MS and/or MSD Recovery is outside acceptance limits.  
F2: MS/MSD RPD exceeds control limits  
H: sample was prepped or analyzed beyond the specified holding time  
Val Q: Validation (lab.) qualifier. Noted if different from Lab Q.  
U: Qualified as non-detect  
J: the concentration is an approximate value  
UJ: the analyte was analyzed for, but was not detected and the reported quantitation limit is approximate  
--: Val Q. is equal to Lab Q.

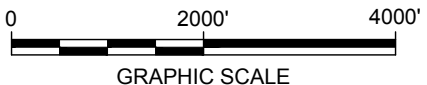
# FIGURES



CITY: MINNEAPOLIS, MN DIV/GROUP: ENV/CAD DB: R. OBERLANDER LD: R. OBERLANDER PIC:(Opt) PM:(Read) TM:(Opt) L:YR:(Opt)ONL:OFF=REF  
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REFERENCE: BASE MAP USGS QUADS., 7.5 MIN. SERIES (TOPOGRAPHIC) - EDMONDS EAST, WASH. AND EDMONDS WEST, WASH.



GRAPHIC SCALE



WASHINGTON



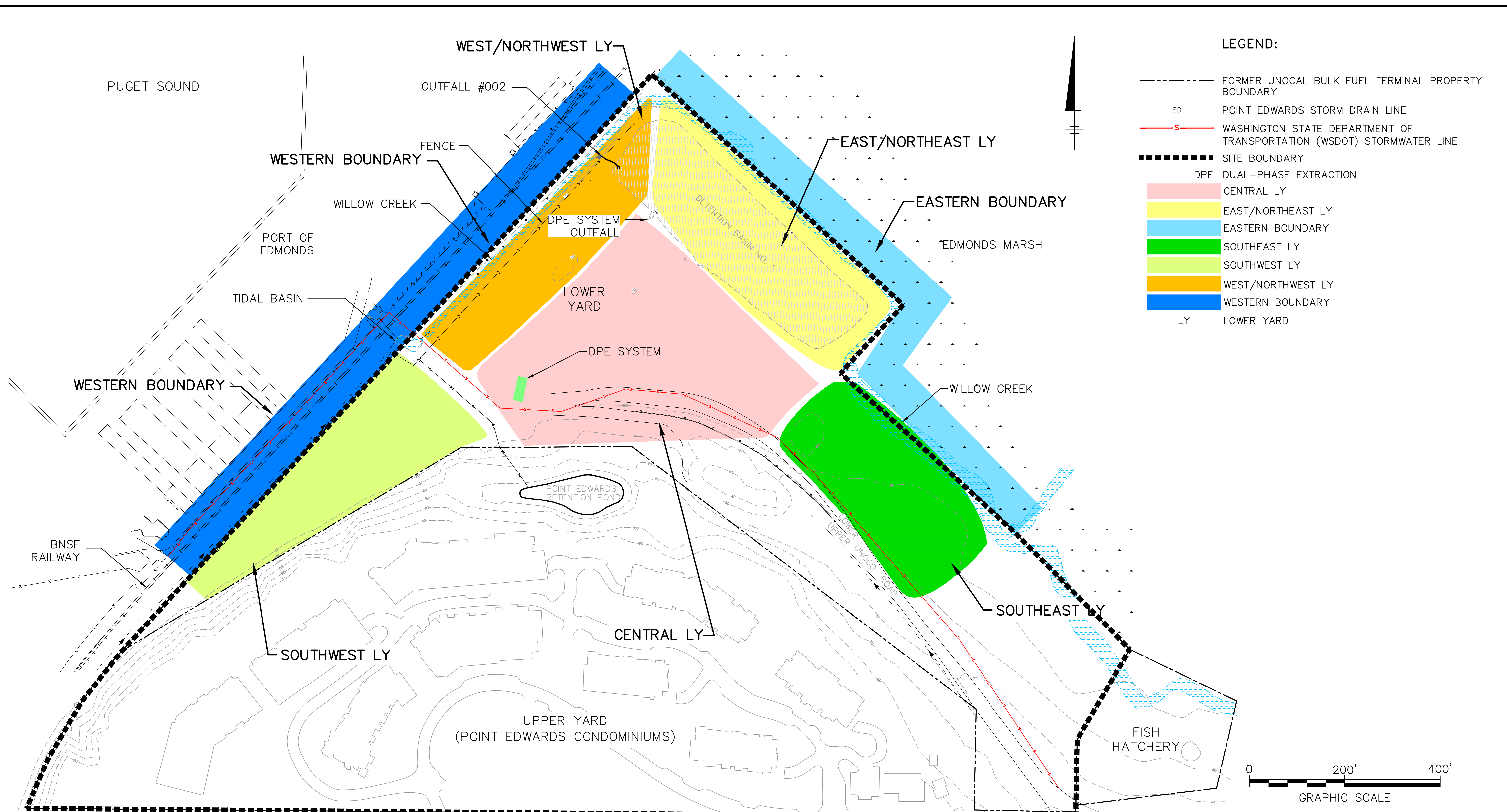
CHEVRON ENVIRONMENTAL MANAGEMENT COMPANY  
 FORMER UNOCAL EDMONDS BULK FUEL TERMINAL  
 EDMONDS, WASHINGTON  
**2018 GROUNDWATER AND OPERATION REPORT**

**SITE LOCATION**

	<p><i>Design &amp; Consultancy for natural and built assets</i></p>	<p>FIGURE <b>1-1</b></p>
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CITY: MINNEAPOLIS, MN DIV/GROUP: ENV/CAD DR: R. OBERLANDER LD: (Opt) PIC: K. ABBOTT PM: S. ZORN TM: S. ZORN Lyr: (Option) OFF: REF  
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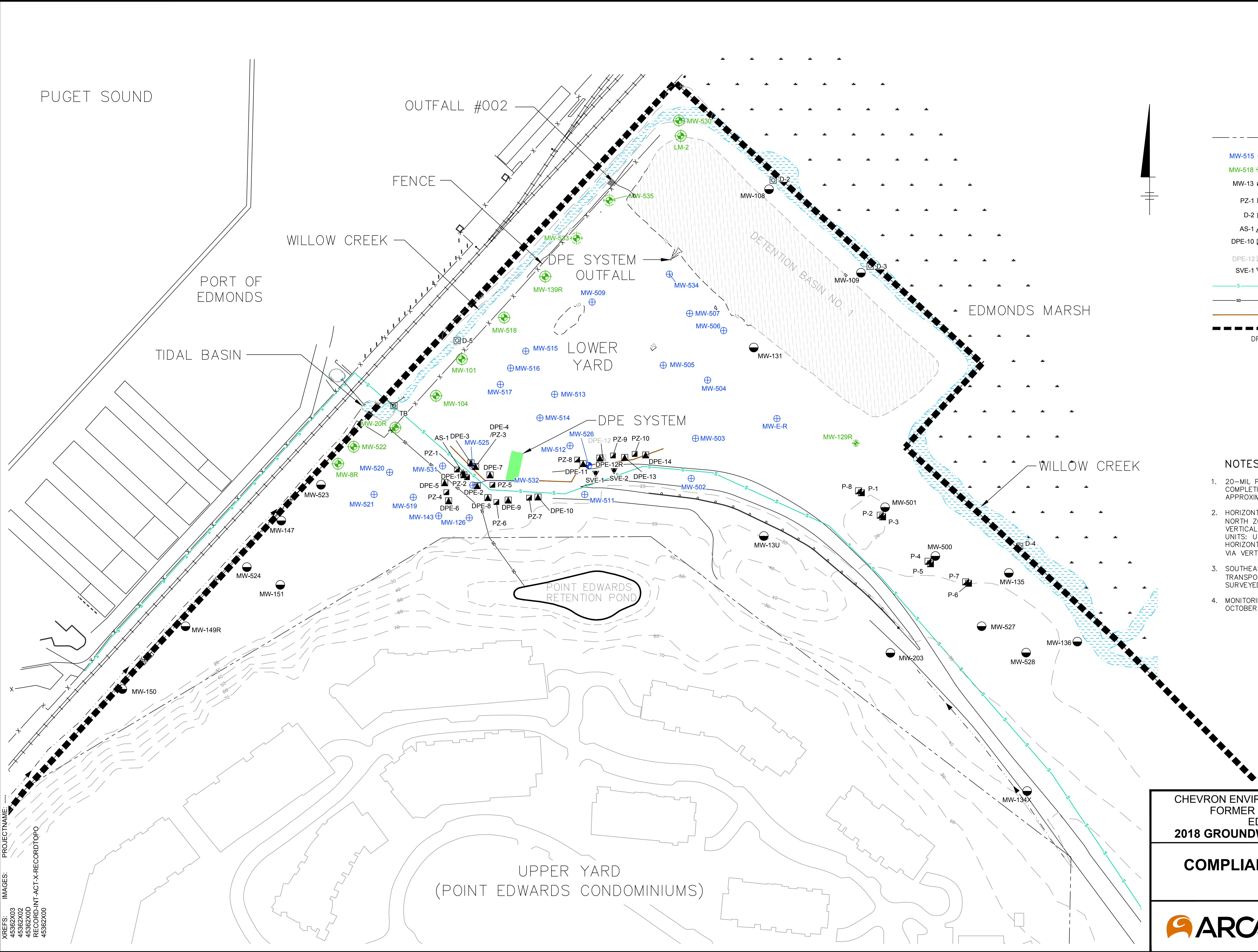


CHEVRON ENVIRONMENTAL MANAGEMENT COMPANY  
 FORMER UNOCAL BULK FUEL TERMINAL  
 EDMONDS, WASHINGTON  
 2018 GROUNDWATER AND OPERATION REPORT

**SITE LAYOUT**

**ARCADIS** Design & Consultancy  
 for natural and built assets

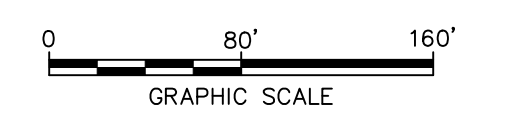
FIGURE  
**2-1**



**LEGEND:**

- FORMER UNOCAL BULK FUEL TERMINAL PROPERTY BOUNDARY
- MW-515 ● INTERIOR MONITORING WELL LOCATION
- MW-518 ○ PERIMETER MONITORING WELL LOCATION
- MW-13 ○ MONITORING WELL LOCATION
- PZ-1 ▣ PIEZOMETER LOCATION
- D-2 □ STAFF GAUGE LOCATION
- AS-1 ▲ AIR SPARGE WELL LOCATION
- DPE-10 ▲ DUAL PHASE EXTRACTION (DPE) WELL LOCATION
- DPE-12 ▲ DECOMMISSIONED DPE WELL LOCATION
- SVE-1 ▽ SOIL VAPOR EXTRACTION (SVE) WELL LOCATION
- WSDOT STORMWATER LINE
- POINT EDWARDS STORM DRAIN LINE
- 20-MIL POLYETHYLENE SHEETING
- - - SITE BOUNDARY
- DPE DUAL-PHASE EXTRACTION

- NOTES:**
1. 20-MIL POLYETHYLENE SHEETING INSTALLED UPON COMPLETION OF PHASE I EXCAVATION. SHEETING REACHES TO APPROXIMATELY 7.5 FEET ABOVE MEAN SEA LEVEL.
  2. HORIZONTAL DATUM: WASHINGTON STATE COORDINATE SYSTEM NORTH ZONE (NAD 83/98). VERTICAL DATUM: N.A.V.D. 88. UNITS: U.S. SURVEY FEET. HORIZONTAL AND VERTICAL CONTROL ESTABLISHED BY GPS VIA VERTICAL REFERENCE STATION NETWORK (VRSN).
  3. SOUTHEAST PORTION OF WASHINGTON STATE DEPARTMENT OF TRANSPORTATION (WSDOT) STORMWATER LINE HAS NOT BEEN SURVEYED.
  4. MONITORING WELL MW-E WAS RE-INSTALLED IN PLACE ON OCTOBER 20th, 2017 AND RENAMED MW-E-R.



CHEVRON ENVIRONMENTAL MANAGEMENT COMPANY  
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 EDMONDS, WASHINGTON

**2018 GROUNDWATER AND OPERATION REPORT**

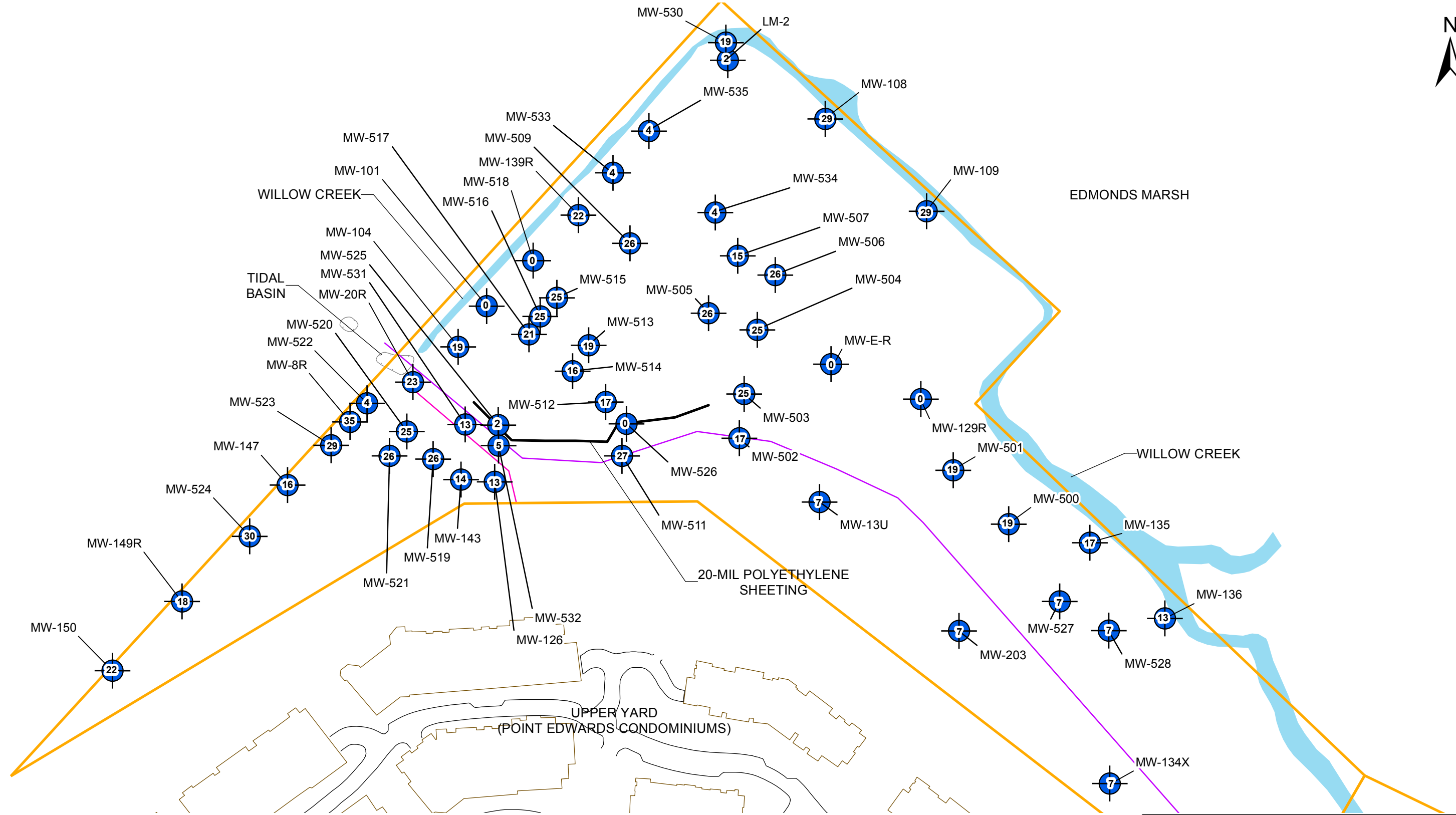
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**COMPLIANCE MONITORING WELL LOCATIONS**

---

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FIGURE 3-1



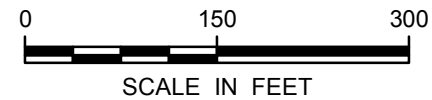
**LEGEND**

- WELL AND NUMBER OF CONSECUTIVE SAMPLING ROUNDS SHOWING CONCENTRATIONS OF TOTAL PETROLEUM HYDROCARBONS (TPH) LESS THAN PROPOSED GROUNDWATER CLEANUP LEVELS (CULs)
- WSDOT STORMWATER LINE
- POINT EDWARDS STORM DRAIN LINE
- LOWER YARD PROPERTY BOUNDARY

**NOTES:**

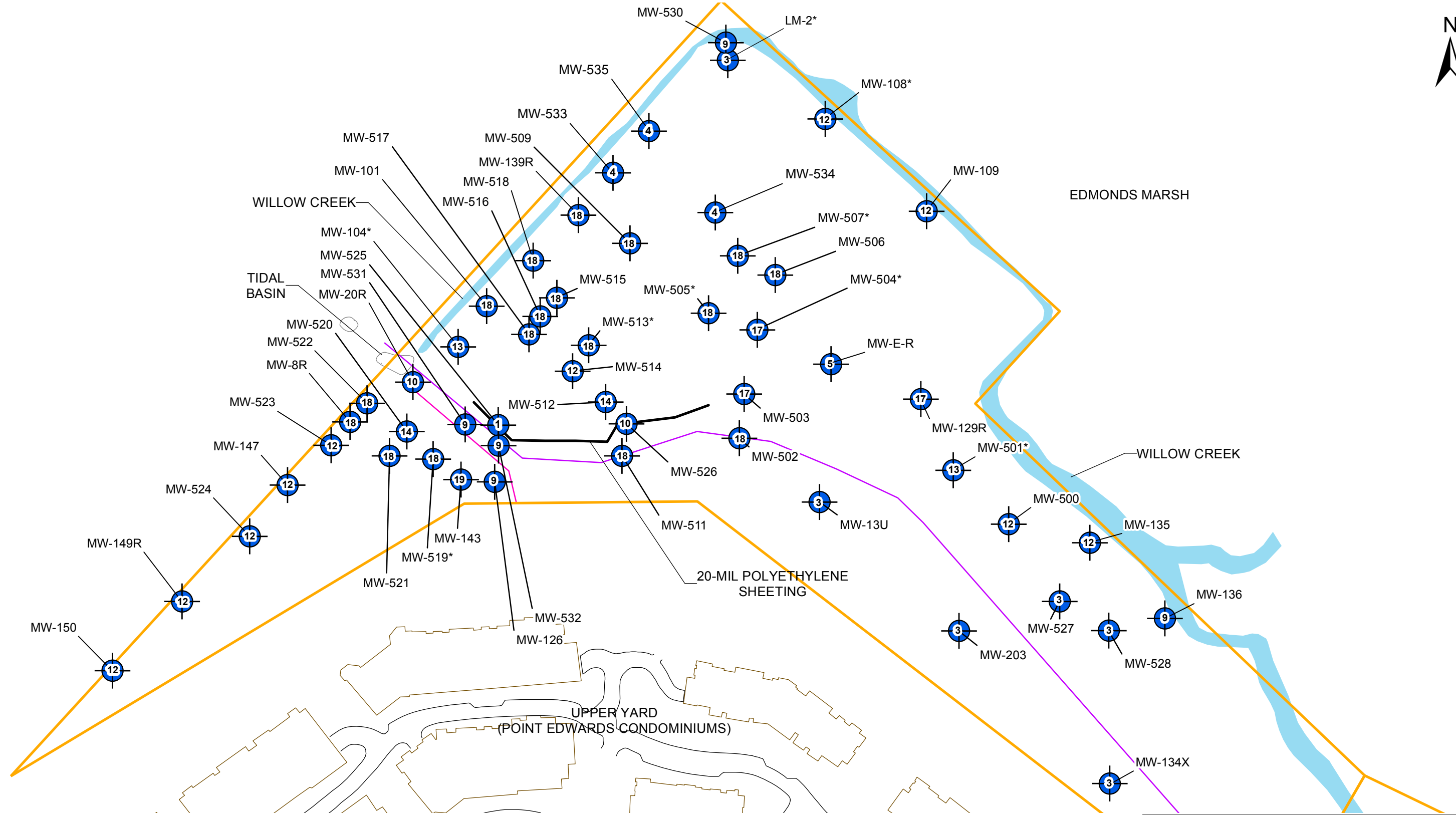
1. 20-MIL POLYETHYLENE SHEETING INSTALLED UPON COMPLETION OF PHASE I EXCAVATION. SHEETING REACHES TO APPROXIMATELY 7.5 FEET ABOVE MEAN SEA LEVEL.
2. SOUTHEAST PORTION OF WSDOT STORMWATER LINE HAS NOT BEEN SURVEYED.
3. MONITORING WELL MW-E WAS RE-INSTALLED IN PLACE ON OCTOBER 20<sup>TH</sup>, 2017 AND RENAMED MW-E-R.
4. MONITORING WELLS MW-508, MW-510 AND MW-529 WERE EXCAVATED IN THIRD QUARTER 2017. MONITORING WELLS MW-533, MW-534 AND MW-535 WERE INSTALLED POST-EXCAVATION ON OCTOBER 20<sup>TH</sup>, 2017.

MG/KG - MILLIGRAMS PER KILOGRAM  
 WSDOT = WASHINGTON STATE DEPARTMENT OF TRANSPORTATION



CHEVRON ENVIRONMENTAL MANAGEMENT COMPANY FORMER UNOCAL BULK FUEL TERMINAL EDMONDS, WASHINGTON <b>2018 GROUNDWATER AND OPERATION REPORT</b>
<b>SITE GROUNDWATER TPH REMEDIATION STATUS - FOURTH QUARTER 2018</b>
<span style="font-size: 24pt; font-weight: bold; vertical-align: middle;">3-2</span>

CITY: HIGHLANDS RANCH, CO DIV/GROUP: (ENV/GIS) DB: B. GRIFFITH  
Path: Z:\GIS\Projects\ENV\Chevron\_Edmonds\Remediation\_Status\_Baseline\_Event\_Q4\_2018.mxd Date: 2/5/2019 Time: 10:52:25 AM

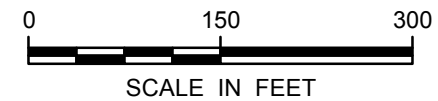


**LEGEND**

- WELL AND NUMBER OF CONSECUTIVE SAMPLING ROUNDS SHOWING CONCENTRATIONS OF BENZENE LESS THAN OR EQUAL TO PROPOSED GROUNDWATER(GW) CUL (16 µg/L) AND THE GW SOIL VAPOR SCREENING LEVEL - METHOD B (2.4 µg/L)
- WSDOT STORMWATER LINE
- POINT EDWARDS STORM DRAIN LINE
- LOWER YARD PROPERTY BOUNDARY

**NOTES:**

1. 20-MIL POLYETHYLENE SHEETING INSTALLED UPON COMPLETION OF PHASE I EXCAVATION. SHEETING REACHES TO APPROXIMATELY 7.5 FEET ABOVE MEAN SEA LEVEL.
  2. SOUTHEAST PORTION OF WSDOT STORMWATER LINE HAS NOT BEEN SURVEYED.
  3. BENZENE WAS ANALYZED DURING 18 EVENTS FOR MOST OF THE WELLS SINCE OCTOBER 2008.
  4. MONITORING WELLS MW-508, MW-510 AND MW-529 WERE EXCAVATED IN THIRD QUARTER 2017.
- MONITORING WELLS MW-533, MW-534 AND MW-535 WERE INSTALLED POST-EXCAVATION ON OCTOBER 20<sup>th</sup>, 2017.  
\* - BENZENE WAS NOT DETECTED IN THE SAMPLE COLLECTED FROM THE MONITORING WELL HOWEVER THE DETECTION LIMIT WAS ABOVE THE CUL DUE TO A LABORATORY SAMPLE DILUTION. NUMBER OF CONSECUTIVE QUARTER SINCE LAST DETECTION ABOVE GW SOIL VAPOR SCREENING LEVEL - METHOD B. µg/L - MICROGRAMS PER LITER, CUL - CLEANUP LEVEL



CHEVRON ENVIRONMENTAL MANAGEMENT COMPANY  
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2018 GROUNDWATER AND OPERATION REPORT

**GROUNDWATER BENZENE  
REMEDICATION STATUS - FOURTH QUARTER 2018**

FIGURE  
**3-3**

# APPENDIX A

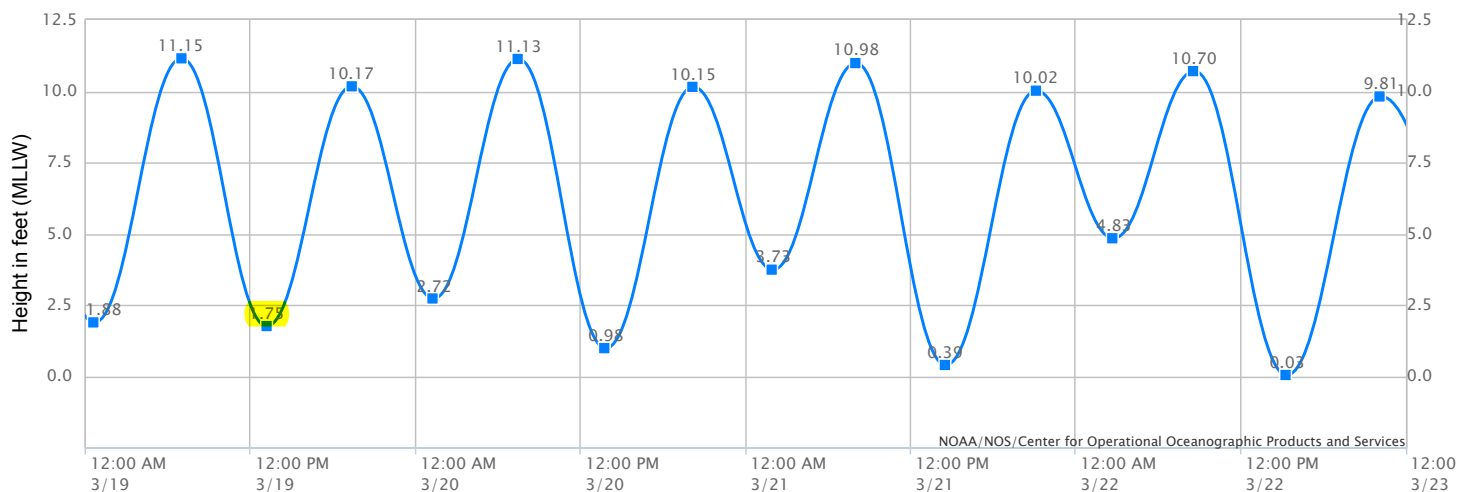
National Oceanic and Atmospheric Administration Edmonds Tide Charts





[Help](#)

NOAA/NOS/CO-OPS  
 Tide Predictions at 9447427, EDMONDS W A  
 From 2018/03/19 12:00 AM LST/LDT to 2018/03/22 11:59 PM LST/LDT  
 Subordinate Station | Ref. Station (Seattle 9447130) | Time offsets (high: 0 min. low: -4 min.) | Height offsets (high: \*0.96 ft. low: \*0.99 ft.)



Note: The interval is High/Low, the solid blue line depicts a curve fit between the high and low values and approximates the segments between.  
 Disclaimer: These data are based upon the latest information available as of the date of your request, and may differ from the published tide tables.

High/Low Tide Prediction Data Listing

Station Name: EDMONDS, WA  
 Action: Daily  
 Product: Tide Predictions  
 Start Date & Time: 2018/3/19 12:00 AM  
 End Date & Time: 2018/3/22 11:59 PM

Source: NOAA/NOS/CO-OPS  
 Prediction Type: Subordinate  
 Datum: MLLW  
 Height Units: Feet  
 Time Zone: LST/LDT

Date	Day	Time	Hgt	Time	Hgt	Time	Hgt	Time	Hgt
2018/03/19	Mon	12:37 AM	1.88 L	06:57 AM	11.15 H	1:09 PM	1.75 L	7:20 PM	10.17 H
2018/03/20	Tue	01:17 AM	2.72 L	07:27 AM	11.13 H	1:48 PM	0.98 L	8:10 PM	10.15 H
2018/03/21	Wed	01:58 AM	3.73 L	08:00 AM	10.98 H	2:32 PM	0.39 L	9:06 PM	10.02 H
2018/03/22	Thu	02:44 AM	4.83 L	08:37 AM	10.70 H	3:20 PM	0.03 L	10:10 PM	9.81 H

# 9447427 EDMONDS, WA

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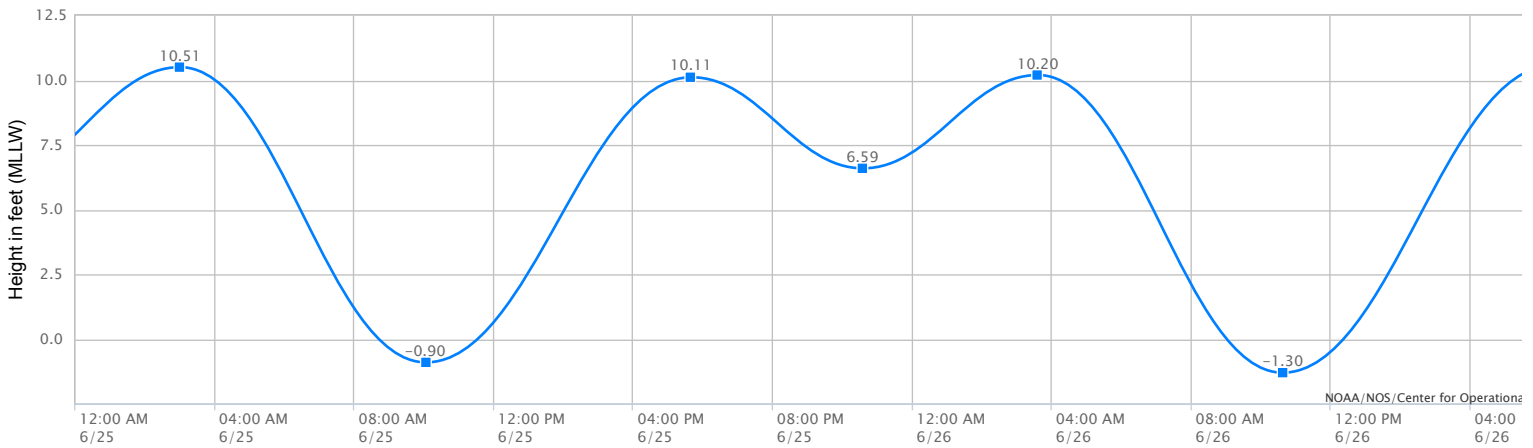
[Station Info](#) ▾ | 
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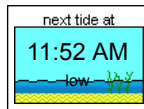
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NOAA/NOS/CO-OPS  
 Tide Predictions at 9447427, EDMONDS W A  
 From 2018/06/25 12:00 AM LST/LDT to 2018/06/26 1 1:59 PM LST/LDT  
 Subordinate Station | Ref. Station (Seattle 9447130) | Time offsets (high: 0 min. low: -4 min.) | Height offsets (high: \*0.96 ft. low: \*0.99 ft.)



## Today's Tides (LST/LDT)



4:49 AM	high	11.03 ft.
11:52 AM	low	-3.51 ft.
7:18 PM	high	11.62 ft.

## Options for

9447427 EDMONDS, WA

## Day of the Week

Predicted (ft)

High/Low

## From:

Jun ▾ 25 ▾ 2018

## To:

Jun ▾ 26 ▾ 2018

Note: The maximum range is 31 days.

## Units

Feet ▾

## Timezone

LST/LDT ▾

Datum (datum\_options.html)

MLLW ▼

12 Hour/24 Hour Clock

12 Hour ▼

Data Interval

High/Low ▼

Shift Dates

Back 1 Day

Forward 1 Day

Threshold Direction

>= ▼

Threshold Value

Update

Plot Daily

Plot Calendar

Data Only

Data Listing

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Date	Day of the Week	Time (LST/LDT)	Predicted (ft)	High/Low
2018/06/25	Mon	03:00 AM	10.51	H
2018/06/25	Mon	10:03 AM	-0.90	L
2018/06/25	Mon	5:40 PM	10.11	H
2018/06/25	Mon	10:35 PM	6.59	L
2018/06/26	Tue	03:36 AM	10.20	H
2018/06/26	Tue	10:37 AM	-1.30	L
2018/06/26	Tue	6:22 PM	10.56	H
2018/06/26	Tue	11:25 PM	6.85	L

Disclaimer: These data are based upon the latest information available as of the date of your request, and may differ from the published tide tables.

Note: The interval above is High/Low, the solid blue line depicts a curve fit between the high and low values and approximates the segments between.

Products available at 9447427 EDMONDS, W A

TIDES/WATER LEVELS

Water Levels (/waterlevels.html?id=9447427)

NOAA Tide Predictions (/noaatidepredictions.html?id=9447130)

Harmonic Constituents (/harcon.html?id=9447427)

Sea Level Trends (/sltrends/sltrends\_station.shtml?id=9447427)

Datums (/datums.html?id=9447427)

Bench Mark Sheets (/benchmarks.html?id=9447427)

Extreme Water Levels (/est/est\_station.shtml?stnid=9447130)

Reports (/reports.html?id=9447427)

METEOROLOGICAL/OTHER

Meteorological Observations (/met.html?id=9447427)

Water Temp/Conductivity

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Revised: 10/15/2013

NOAA (<http://www.noaa.gov>) / National Ocean Service (<http://oceanservice.noaa.gov>)

Web site owner: Center for Operational Oceanographic Products and Services

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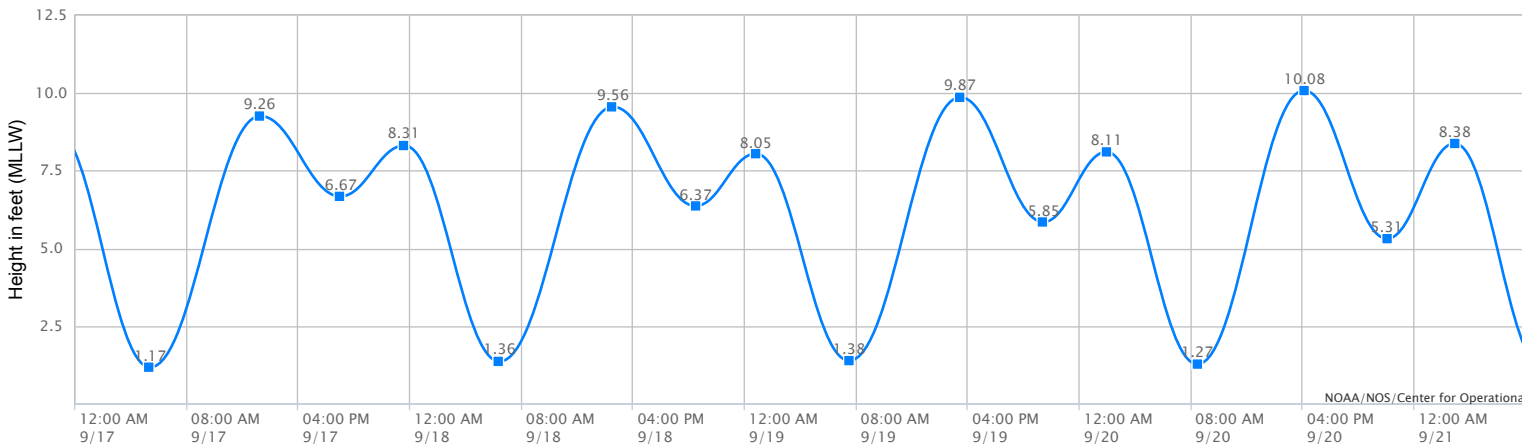
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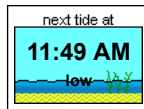
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**NOAA/NOS/CO-OPS**  
**Tide Predictions at 9447427, EDMONDS WA**  
**From 2018/09/17 12:00 AM LST/LDT to 2018/09/21 11:59 PM LST/LDT**  
**Subordinate Station | Ref. Station (Seattle 9447130) | Time offsets (high: 0 min. low: -4 min.) | Height offsets (high: \*0.96 ft. low: \*0.99 ft.)**



### Today's Tides (LST/LDT)



5:28 AM	high	10.66 ft.
11:49 AM	low	-0.56 ft.
6:27 PM	high	11.43 ft.

Options for

9447427 EDMONDS, WA

Day of the Week

Predicted (ft)

High/Low

From:

Sep ▾ 17 ▾ 2018

To:

Sep ▾ 21 ▾ 2018

Note: The maximum range is 31 days.

Units

Feet ▾

Timezone

LST/LDT ▾

Datum (datum\_options.html)

MLLW ▼

12 Hour/24 Hour Clock

12 Hour ▼

Data Interval

High/Low ▼

Shift Dates

Back 1 Day

Forward 1 Day

Threshold Direction

>= ▼

Threshold Value

Update

Plot Daily

Plot Calendar

Data Only

### Data Listing

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Date	Day of the Week	Time (LST/LDT)	Predicted (ft)	High/Low
2018/09/17	Mon	05:21 AM	1.17	L
2018/09/17	Mon	1:15 PM	9.26	H
2018/09/17	Mon	7:00 PM	6.67	L
2018/09/17	Mon	11:35 PM	8.31	H
2018/09/18	Tue	06:24 AM	1.36	L
2018/09/18	Tue	2:32 PM	9.56	H
2018/09/18	Tue	8:28 PM	6.37	L
2018/09/19	Wed	12:47 AM	8.05	H
2018/09/19	Wed	07:28 AM	1.38	L
2018/09/19	Wed	3:26 PM	9.87	H
2018/09/19	Wed	9:24 PM	5.85	L
2018/09/20	Thu	01:55 AM	8.11	H
2018/09/20	Thu	08:26 AM	1.27	L
2018/09/20	Thu	4:05 PM	10.08	H
2018/09/20	Thu	10:02 PM	5.31	L
2018/09/21	Fri	02:53 AM	8.38	H
2018/09/21	Fri	09:14 AM	1.13	L
2018/09/21	Fri	4:33 PM	10.21	H
2018/09/21	Fri	10:31 PM	4.78	L

Disclaimer: These data are based upon the latest information available as of the date of your request, and may differ from the published tide tables.

Note: The interval above is High/Low, the solid blue line depicts a curve fit between the high and low values and approximates the segments between.

### Products available at 9447427 EDMONDS, WA

#### TIDES/WATER LEVELS

Water Levels (/waterlevels.html?id=9447427)

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Harmonic Constituents (/harcon.html?id=9447427)

[Sea Level Trends \(/sltrends/sltrends\\_station.shtml?id=9447427\)](/sltrends/sltrends_station.shtml?id=9447427)

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[Extreme Water Levels \(/est/est\\_station.shtml?stnid=9447130\)](/est/est_station.shtml?stnid=9447130)

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Revised: 08/08/2018

NOAA (<http://www.noaa.gov>) / National Ocean Service (<http://oceanservice.noaa.gov>)

Web site owner: Center for Operational Oceanographic Products and Services

# 9447427 EDMONDS, WA

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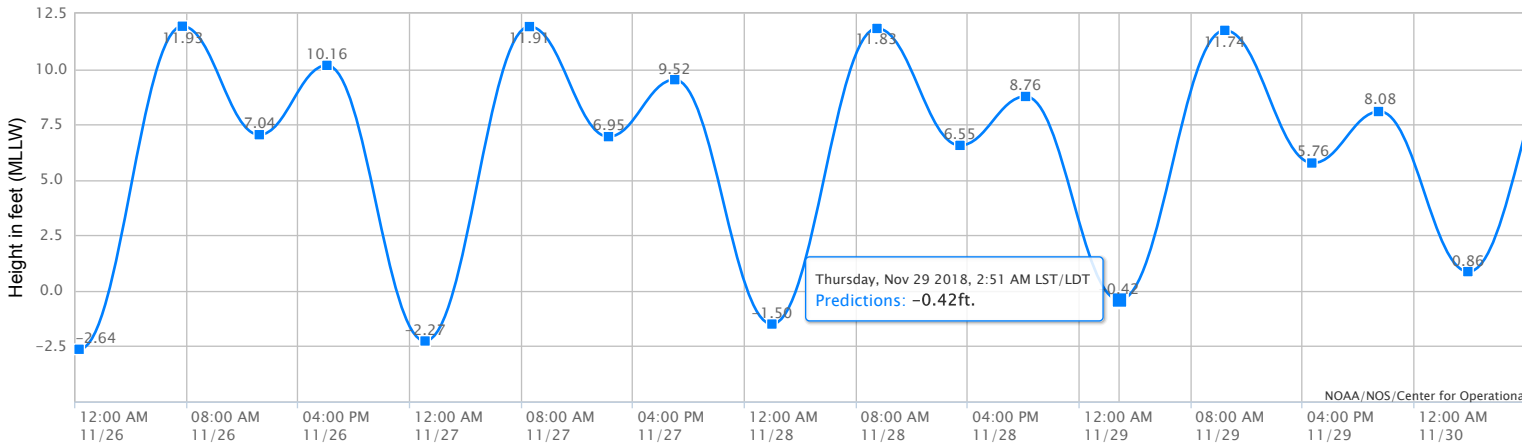
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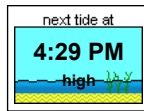
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**NOAA/NOS/CO-OPS**  
**Tide Predictions at 9447427, EDMONDS WA**  
**From 2018/11/26 12:00 AM LST/LDT to 2018/11/30 11:59 PM LST/LDT**  
**Subordinate Station | Ref. Station (Seattle 9447130) | Time offsets (high: 0 min. low: -4 min.) | Height offsets (high: \*0.96 ft. low: \*0.99 ft.)**



### Today's Tides (LST/LDT)



Time	Type	Height (ft.)
5:37 AM	high	11.00 ft.
11:04 AM	low	5.25 ft.
<b>4:29 PM</b>	<b>high</b>	<b>10.79 ft.</b>
11:13 PM	low	-1.39 ft.

Date	Day of the Week	Predicted (ft)	High/Low
<b>Open (LST/LDT)</b> 9447427 EDMONDS, WA			
From:			
Nov	26	2018	
To:			
Nov	30	2018	
Note: The maximum range is 31 days.			
Units			
Feet ▾			
Timezone			

LST/LDT ▾

Datum (datum\_options.html)

MLLW ▾

12 Hour/24 Hour Clock

12 Hour ▾

Data Interval

High/Low ▾

Shift Dates

Back 1 Day

Forward 1 Day

Threshold Direction

>= ▾

Threshold Value

Update

Plot Daily

Plot Calendar

Data Only

Data Listing

Web Services

Download TXT

Download XML

Date	Day of the Week	Time (LST/LDT)	Predicted (ft)	High/Low
2018/11/26	Mon	12:16 AM	-2.64	L
2018/11/26	Mon	07:40 AM	11.93	H
2018/11/26	Mon	1:11 PM	7.04	L
2018/11/26	Mon	6:02 PM	10.16	H
2018/11/27	Tue	01:04 AM	-2.27	L
2018/11/27	Tue	08:33 AM	11.91	H
2018/11/27	Tue	2:13 PM	6.95	L
2018/11/27	Tue	6:58 PM	9.52	H
2018/11/28	Wed	01:56 AM	-1.50	L
2018/11/28	Wed	09:28 AM	11.83	H
2018/11/28	Wed	3:25 PM	6.55	L
2018/11/28	Wed	8:07 PM	8.76	H
2018/11/29	Thu	02:51 AM	-0.42	L
2018/11/29	Thu	10:24 AM	11.74	H
2018/11/29	Thu	4:43 PM	5.76	L
2018/11/29	Thu	9:30 PM	8.08	H
2018/11/30	Fri	03:52 AM	0.86	L
2018/11/30	Fri	11:18 AM	11.69	H
2018/11/30	Fri	5:57 PM	4.57	L
2018/11/30	Fri	11:04 PM	7.77	H

Disclaimer: These data are based upon the latest information available as of the date of your request, and may differ from the published tide tables.

Note: The interval above is High/Low, the solid blue line depicts a curve fit between the high and low values and approximates the segments between.

[Water Levels \(/waterlevels.html?id=9447427\)](/waterlevels.html?id=9447427)

[NOAA Tide Predictions \(/noaatidepredictions.html?id=9447130\)](/noaatidepredictions.html?id=9447130)

[Harmonic Constituents \(/harcon.html?id=9447427\)](/harcon.html?id=9447427)

[Sea Level Trends \(/sltrends/sltrends\\_station.shtml?id=9447427\)](/sltrends/sltrends_station.shtml?id=9447427)

[Datums \(/datums.html?id=9447427\)](/datums.html?id=9447427)

[Bench Mark Sheets \(/benchmarks.html?id=9447427\)](/benchmarks.html?id=9447427)

[Extreme Water Levels \(/est/est\\_station.shtml?stnid=9447130\)](/est/est_station.shtml?stnid=9447130)

[Reports \(/reports.html?id=9447427\)](/reports.html?id=9447427)

#### **METEOROLOGICAL/OTHER**

[Meteorological Observations \(/met.html?id=9447427\)](/met.html?id=9447427)

[Water Temp/Conductivity](#)

#### **PORTS®**

This station is not a member of PORTS®

#### **OPERATIONAL FORECAST SYSTEMS**

This station is not a member of OFS

#### **INFORMATION**

[Station Home Page \(/stationhome.html?id=9447427\)](/stationhome.html?id=9447427)

[Data Inventory \(/inventory.html?id=9447427\)](/inventory.html?id=9447427)

[Measurement Specifications \(/measure.html\)](/measure.html)

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[Tide Predictions \(/tide\\_predictions.html\)](/tide_predictions.html)

[Currents \(/cdata/StationList?type=Current+Data&filter=active\)](/cdata/StationList?type=Current+Data&filter=active)

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[More about programs... \(/programs.html\)](/programs.html)

#### **Partners**

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[Marsh Restoration \(/marsh.html\)](/marsh.html)

[GoMOOS \(/gomoos.html\)](/gomoos.html)

[TCOON \(/tcoon.html\)](/tcoon.html)

Revised: 08/08/2018

NOAA (<http://www.noaa.gov>) / National Ocean Service (<http://oceanservice.noaa.gov>)

Web site owner: Center for Operational Oceanographic Products and Services

# APPENDIX B

## Groundwater Sampling Event Field Notes





# Low-Flow Test Report:

**Test Date / Time:** 3/20/2018 2:46:19 PM  
**Project:** Edmonds Terminal 1Q18 (2) (2) (2)  
**Operator Name:** EK

<b>Location Name: LM-2</b> <b>Well Diameter: 2 in</b> <b>Casing Type: PVC</b> <b>Screen Length: 5.5 ft</b> <b>Top of Screen: 2.5 ft</b> <b>Total Depth: 8 ft</b> <b>Initial Depth to Water: 1.66 ft</b>	<b>Pump Type: Geotech geopump series 2</b> <b>Tubing Type: Polyethylene 0.170 x 1/4"</b> <b>Pump Intake From TOC: 9 ft</b> <b>Estimated Total Volume Pumped: 5400 ml</b> <b>Flow Cell Volume: 130 ml</b> <b>Final Flow Rate: 150 ml/min</b> <b>Final Draw Down: 1.24 ft</b>	<b>Instrument Used: Aqua TROLL 600 Vented</b> <b>Serial Number: 457166</b>
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## Test Notes:

**Weather Conditions:**  
Sunny and 50

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15 %		
3/20/2018 2:46 PM	00:00	6.32 pH	52.47 °F	6,470.0 µS/cm	0.47 mg/L	19.07 NTU	-13.9 mV	1.66 ft	150.00 ml/min
3/20/2018 2:49 PM	03:00	6.24 pH	52.10 °F	6,564.5 µS/cm	0.56 mg/L	37.57 NTU	-10.2 mV	1.66 ft	150.00 ml/min
3/20/2018 2:52 PM	06:00	6.20 pH	51.85 °F	6,700.5 µS/cm	0.56 mg/L	32.24 NTU	-8.1 mV	1.66 ft	150.00 ml/min
3/20/2018 2:55 PM	09:00	6.20 pH	51.75 °F	6,823.9 µS/cm	0.54 mg/L	35.15 NTU	-7.5 mV	1.66 ft	150.00 ml/min
3/20/2018 2:58 PM	12:00	6.20 pH	51.69 °F	6,809.4 µS/cm	0.56 mg/L	26.45 NTU	-8.0 mV	1.66 ft	150.00 ml/min
3/20/2018 3:01 PM	15:00	6.22 pH	51.61 °F	6,795.6 µS/cm	0.51 mg/L	36.91 NTU	-9.3 mV	1.66 ft	150.00 ml/min
3/20/2018 3:04 PM	18:00	6.24 pH	51.62 °F	6,725.2 µS/cm	0.50 mg/L	30.09 NTU	-10.7 mV	1.66 ft	150.00 ml/min
3/20/2018 3:07 PM	21:00	6.25 pH	51.72 °F	6,753.1 µS/cm	0.46 mg/L	25.92 NTU	-12.3 mV	1.66 ft	150.00 ml/min
3/20/2018 3:10 PM	24:00	6.25 pH	52.41 °F	6,806.4 µS/cm	0.48 mg/L	57.96 NTU	-13.2 mV	1.66 ft	150.00 ml/min
3/20/2018 3:13 PM	27:00	6.25 pH	52.57 °F	6,852.9 µS/cm	0.44 mg/L	16.40 NTU	-14.0 mV	1.66 ft	150.00 ml/min
3/20/2018 3:16 PM	30:00	6.24 pH	53.83 °F	6,976.2 µS/cm	0.50 mg/L	22.11 NTU	-14.5 mV	1.66 ft	150.00 ml/min
3/20/2018 3:19 PM	33:00	6.24 pH	54.87 °F	6,870.0 µS/cm	0.48 mg/L	38.86 NTU	-14.4 mV	1.66 ft	150.00 ml/min

3/20/2018 3:22 PM	36:00	6.26 pH	53.75 °F	6,640.4 μS/cm	0.48 mg/L	24.32 NTU	-14.5 mV	1.66 ft	150.00 ml/min
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## Samples

Sample ID:	Description:
LM-2	Sample time 1425 Final DTW: 2.90 ft btoc Final RDO: 0.48 mg/L

# Low-Flow Test Report:

Test Date / Time: 3/20/2018 11:31:11 AM

Project: Edmonds Terminal 1q18 (2)

Operator Name: JI

<b>Location Name: MW-8R</b> <b>Well Diameter: 2 cm</b> <b>Casing Type: Pvc</b> <b>Screen Length: 10 m</b> <b>Top of Screen: 3 m</b> <b>Total Depth: 13 m</b> <b>Initial Depth to Water: 7.91 ft</b>	<b>Pump Type: Geotech geopump series 2</b> <b>Tubing Type: Polyethylene 0.170" x 1/4"</b> <b>Pump Intake From TOC: 10 ft</b> <b>Estimated Total Volume Pumped: 1350 ml</b> <b>Flow Cell Volume: 130 ml</b> <b>Final Flow Rate: 150 ml/min</b> <b>Final Draw Down: 0.06 ft</b>	<b>Instrument Used: Aqua TROLL 600 Vented</b> <b>Serial Number: 469050</b>
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## Test Notes:

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15 %		
3/20/2018 11:31 AM	00:00	6.91 pH	48.67 °F	371.08 µS/cm	1.72 mg/L	0.00 NTU	105.8 mV	7.91 ft	150.00 ml/min
3/20/2018 11:34 AM	03:00	6.87 pH	48.61 °F	361.04 µS/cm	0.51 mg/L	7.12 NTU	105.4 mV	7.91 ft	150.00 ml/min
3/20/2018 11:37 AM	06:00	6.87 pH	48.59 °F	357.39 µS/cm	0.51 mg/L	0.00 NTU	105.0 mV	7.91 ft	150.00 ml/min
3/20/2018 11:40 AM	09:00	6.86 pH	48.54 °F	355.34 µS/cm	0.49 mg/L	0.00 NTU	104.9 mV	7.91 ft	150.00 ml/min

## Samples

Sample ID:	Description:
Mw-8r	Sample time: 1042 Final dtw: 7.97 Final rdo: 0.48

# Low-Flow Test Report:

**Test Date / Time:** 3/22/2018 11:19:36 AM

**Project:** Edmonds Terminal 1Q18

**Operator Name:** Patrick Collins

<b>Location Name: MW-20R</b> <b>Well Diameter: 2 in</b> <b>Casing Type: PVC</b> <b>Screen Length: 10 ft</b> <b>Top of Screen: 3 ft</b> <b>Total Depth: 13 ft</b> <b>Initial Depth to Water: 5.92 ft</b>	<b>Pump Type: Geotech geopump series 2</b> <b>Tubing Type: Polyethylene 0.170" x 1/4"</b> <b>Pump Intake From TOC: 8 ft</b> <b>Estimated Total Volume Pumped: 6750 ml</b> <b>Flow Cell Volume: 130 ml</b> <b>Final Flow Rate: 150 ml/min</b> <b>Final Draw Down: 0.05 ft</b>	<b>Instrument Used: Aqua TROLL 600 Vented</b> <b>Serial Number: 469050</b>
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## Test Notes:

## Weather Conditions:

Raining, cold

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15 %		
3/22/2018 11:19 AM	00:00	6.45 pH	48.73 °F	6,002.0 µS/cm	0.85 mg/L	257.19 NTU	136.9 mV	5.92 ft	150.00 ml/min
3/22/2018 11:22 AM	03:00	6.63 pH	48.58 °F	6,528.4 µS/cm	0.20 mg/L	91.85 NTU	112.9 mV	5.92 ft	150.00 ml/min
3/22/2018 11:25 AM	06:00	6.69 pH	48.52 °F	7,165.9 µS/cm	0.15 mg/L	32.92 NTU	68.4 mV	5.92 ft	150.00 ml/min
3/22/2018 11:28 AM	09:00	6.72 pH	48.56 °F	7,688.1 µS/cm	0.13 mg/L	14.00 NTU	41.0 mV	5.92 ft	150.00 ml/min
3/22/2018 11:31 AM	12:00	6.75 pH	48.55 °F	8,072.5 µS/cm	0.13 mg/L	11.72 NTU	27.6 mV	5.92 ft	150.00 ml/min
3/22/2018 11:34 AM	15:00	6.77 pH	48.61 °F	8,308.2 µS/cm	0.16 mg/L	9.55 NTU	17.7 mV	5.92 ft	150.00 ml/min
3/22/2018 11:37 AM	18:00	6.78 pH	48.60 °F	8,473.3 µS/cm	0.32 mg/L	4.17 NTU	11.5 mV	5.92 ft	150.00 ml/min
3/22/2018 11:40 AM	21:00	6.78 pH	48.63 °F	8,544.2 µS/cm	0.30 mg/L	6.08 NTU	6.6 mV	5.92 ft	150.00 ml/min
3/22/2018 11:43 AM	24:00	6.80 pH	48.61 °F	8,774.5 µS/cm	0.57 mg/L	2.47 NTU	2.5 mV	5.92 ft	150.00 ml/min
3/22/2018 11:46 AM	27:00	6.80 pH	48.59 °F	8,800.7 µS/cm	0.78 mg/L	3.06 NTU	-1.0 mV	5.92 ft	150.00 ml/min
3/22/2018 11:49 AM	30:00	6.81 pH	48.61 °F	8,881.7 µS/cm	0.86 mg/L	1.37 NTU	-3.7 mV	5.92 ft	150.00 ml/min
3/22/2018 11:52 AM	33:00	6.81 pH	48.61 °F	8,926.6 µS/cm	0.93 mg/L	0.00 NTU	-5.9 mV	5.92 ft	150.00 ml/min

3/22/2018 11:55 AM	36:00	6.81 pH	48.62 °F	8,990.0 µS/cm	0.90 mg/L	0.22 NTU	-7.9 mV	5.92 ft	150.00 ml/min
3/22/2018 11:58 AM	39:00	6.81 pH	48.61 °F	8,967.5 µS/cm	0.79 mg/L	0.02 NTU	-9.9 mV	5.92 ft	150.00 ml/min
3/22/2018 12:01 PM	42:00	6.80 pH	48.63 °F	8,981.6 µS/cm	0.74 mg/L	3.10 NTU	-11.5 mV	5.92 ft	150.00 ml/min
3/22/2018 12:04 PM	45:00	6.81 pH	48.65 °F	9,008.7 µS/cm	0.58 mg/L	0.00 NTU	-13.0 mV	5.92 ft	150.00 ml/min

## Samples

Sample ID:	Description:
MW-20R	Sample time 1110

# Low-Flow Test Report:

Test Date / Time: 3/22/2018 10:23:43 AM

Project: Edmonds Terminal 1Q18

Operator Name: Patrick Collins

<b>Location Name: MW-101</b> <b>Well Diameter: 2 in</b> <b>Casing Type: PVC</b> <b>Screen Length: 10 ft</b> <b>Top of Screen: 5 ft</b> <b>Total Depth: 15.2 ft</b> <b>Initial Depth to Water: 8.59 ft</b>	<b>Pump Type: Geotech geopump series 2</b> <b>Tubing Type: Polyethylene 0.170" x 1/4"</b> <b>Pump Intake From TOC: 11 ft</b> <b>Estimated Total Volume Pumped: 1350 ml</b> <b>Flow Cell Volume: 130 ml</b> <b>Final Flow Rate: 150 ml/min</b> <b>Final Draw Down: 0 ft</b>	<b>Instrument Used: Aqua TROLL 600 Vented</b> <b>Serial Number: 469050</b>
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## Test Notes:

## Weather Conditions:

Raining. Cold

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15 %		
3/22/2018 10:23 AM	00:00	6.80 pH	50.79 °F	234.99 µS/cm	7.05 mg/L	5.73 NTU	115.7 mV	8.59 ft	150.00 ml/min
3/22/2018 10:26 AM	03:00	6.67 pH	50.59 °F	233.72 µS/cm	6.66 mg/L	0.33 NTU	112.9 mV	8.59 ft	150.00 ml/min
3/22/2018 10:29 AM	06:00	6.63 pH	50.51 °F	237.95 µS/cm	6.53 mg/L	0.00 NTU	113.8 mV	8.59 ft	150.00 ml/min
3/22/2018 10:32 AM	09:00	6.61 pH	50.41 °F	246.34 µS/cm	5.94 mg/L	0.00 NTU	114.5 mV	8.59 ft	150.00 ml/min

## Samples

Sample ID:	Description:
MW-101	Sample time 0940

# Low-Flow Test Report:

**Test Date / Time:** 3/20/2018 10:17:02 AM

**Project:** Edmonds Terminal 1Q18

**Operator Name:** Patrick Collins

<p><b>Location Name: MW-104</b>  <b>Well Diameter: 2 in</b>  <b>Casing Type: PVC</b>  <b>Screen Length: 10 ft</b>  <b>Top of Screen: 5 ft</b>  <b>Total Depth: 15.2 ft</b>  <b>Initial Depth to Water: 7.86 ft</b></p>	<p><b>Pump Type: Geotech geopump series 2</b>  <b>Tubing Type: Polyethylene 0.170" x 1/4"</b>  <b>Pump Intake From TOC: 12 ft</b>  <b>Estimated Total Volume Pumped: 6750 ml</b>  <b>Flow Cell Volume: 130 ml</b>  <b>Final Flow Rate: 150 ml/min</b>  <b>Final Draw Down: 0.12 ft</b></p>	<p><b>Instrument Used: Aqua TROLL 600 Vented</b>  <b>Serial Number: 468986</b></p>
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## Test Notes:

pH, S. Conduct, and turbidity sensor malfunction. OPR didn't stabilize

## Weather Conditions:

Cloudy, cool

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15 %		
3/20/2018 10:17 AM	00:00	10.48 pH	55.22 °F	0.00 µS/cm	10.82 mg/L	23.23 NTU	170.9 mV	7.86 ft	150.00 ml/min
3/20/2018 10:20 AM	03:00	10.62 pH	51.06 °F	0.00 µS/cm	10.46 mg/L	0.00 NTU	140.1 mV	7.86 ft	150.00 ml/min
3/20/2018 10:23 AM	06:00		50.82 °F	0.00 µS/cm	10.44 mg/L	0.00 NTU	150.8 mV	7.86 ft	150.00 ml/min
3/20/2018 10:26 AM	09:00	9.29 pH	50.73 °F	0.00 µS/cm	10.31 mg/L	0.00 NTU	105.5 mV	7.86 ft	150.00 ml/min
3/20/2018 10:29 AM	12:00		50.66 °F	0.00 µS/cm	10.31 mg/L	0.00 NTU	107.3 mV	7.86 ft	150.00 ml/min
3/20/2018 10:32 AM	15:00	7.55 pH	50.45 °F	0.00 µS/cm	10.31 mg/L	0.00 NTU	68.9 mV	7.86 ft	150.00 ml/min
3/20/2018 10:35 AM	18:00		50.34 °F	0.39 µS/cm	10.35 mg/L	0.00 NTU	40.7 mV	7.86 ft	150.00 ml/min
3/20/2018 10:38 AM	21:00		50.36 °F	0.41 µS/cm	10.34 mg/L	0.00 NTU	10.8 mV	7.86 ft	150.00 ml/min
3/20/2018 10:41 AM	24:00		50.36 °F	0.42 µS/cm	10.35 mg/L	0.00 NTU	-13.0 mV	7.86 ft	150.00 ml/min
3/20/2018 10:44 AM	27:00		50.33 °F	0.42 µS/cm	10.36 mg/L	0.00 NTU	-16.1 mV	7.86 ft	150.00 ml/min
3/20/2018 10:47 AM	30:00		50.34 °F	0.00 µS/cm	10.34 mg/L	0.00 NTU	12.4 mV	7.86 ft	150.00 ml/min
3/20/2018 10:50 AM	33:00		50.29 °F	0.00 µS/cm	10.34 mg/L	0.00 NTU	0.3 mV	7.86 ft	150.00 ml/min

3/20/2018 10:53 AM	36:00		50.30 °F	0.00 µS/cm	10.32 mg/L	0.00 NTU	-4.6 mV	7.86 ft	150.00 ml/min
3/20/2018 10:56 AM	39:00		50.34 °F	0.00 µS/cm	10.32 mg/L	0.00 NTU	35.8 mV	7.86 ft	150.00 ml/min
3/20/2018 10:59 AM	42:00		50.33 °F	0.00 µS/cm	10.33 mg/L	0.00 NTU	3.0 mV	7.86 ft	150.00 ml/min
3/20/2018 11:02 AM	45:00		50.34 °F	0.00 µS/cm	10.31 mg/L	0.00 NTU	22.4 mV	7.86 ft	150.00 ml/min

## Samples

Sample ID:	Description:
MW-104 1Q18	



# Low-Flow Test Report:

Test Date / Time: 3/22/2018 9:32:58 AM

Project: Edmonds Terminal 1Q18

Operator Name: RB

<b>Location Name: MW-126</b> <b>Latitude: 47.8052449009027</b> <b>Longitude: -122.390277944505</b> <b>Well Diameter: 2 in</b> <b>Casing Type: PVC</b> <b>Screen Length: 10 ft</b> <b>Top of Screen: 3.7 ft</b> <b>Total Depth: 13.7 ft</b> <b>Initial Depth to Water: 4.44 ft</b>	<b>Pump Type: Geotech geopump Series 2</b> <b>Tubing Type: Polyethylene 0.17" x 0.25"</b> <b>Pump Intake From TOC: 10 ft</b> <b>Estimated Total Volume Pumped: 3600 ml</b> <b>Flow Cell Volume: 130 ml</b> <b>Final Flow Rate: 200 ml/min</b> <b>Final Draw Down: 1.5 ft</b>	<b>Instrument Used: Aqua TROLL 600 Vented</b> <b>Serial Number: 469079</b>
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## Test Notes:

Sample Time: 0955

Final DTW: 5.94' btoc

Final RDO: 7.04 mg/L

## Weather Conditions:

Heavy Rain, 45F

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15 %		
3/22/2018 9:32 AM	00:00	7.16 pH	8.19 °C	517.11 µS/cm	6.77 mg/L	15.96 NTU	87.9 mV	4.44 ft	200.00 ml/min
3/22/2018 9:35 AM	03:00	7.14 pH	8.07 °C	518.46 µS/cm	6.82 mg/L	17.72 NTU	131.8 mV	4.44 ft	200.00 ml/min
3/22/2018 9:38 AM	06:00	7.14 pH	8.01 °C	518.30 µS/cm	6.88 mg/L	7.44 NTU	167.4 mV	4.44 ft	200.00 ml/min
3/22/2018 9:41 AM	09:00	7.14 pH	7.97 °C	517.57 µS/cm	6.96 mg/L	5.91 NTU	184.7 mV	4.44 ft	200.00 ml/min
3/22/2018 9:44 AM	12:00	7.15 pH	7.99 °C	515.00 µS/cm	6.99 mg/L	1.57 NTU	188.0 mV	4.44 ft	200.00 ml/min
3/22/2018 9:47 AM	15:00	7.14 pH	7.97 °C	516.31 µS/cm	7.00 mg/L	2.39 NTU	193.2 mV	4.44 ft	200.00 ml/min
3/22/2018 9:50 AM	18:00	7.14 pH	7.97 °C	515.26 µS/cm	7.04 mg/L	2.32 NTU	199.5 mV	4.44 ft	200.00 ml/min

## Samples

Sample ID:	Description:
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MW-126	955
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# Low-Flow Test Report:

**Test Date / Time:** 3/20/2018 4:25:38 PM  
**Project:** Edmonds Terminal 1q18 (2) (2) (2) (2)  
**Operator Name:** JI

<b>Location Name:</b> MW-129R <b>Well Diameter:</b> 2 in <b>Casing Type:</b> Pvc <b>Screen Length:</b> 10 ft <b>Top of Screen:</b> 3 ft <b>Total Depth:</b> 13 ft <b>Initial Depth to Water:</b> 5.49 ft	<b>Pump Type:</b> Geotech geopump series 2 <b>Tubing Type:</b> Polyethylene 0.170" x 1/4" <b>Pump Intake From TOC:</b> 10 ft <b>Estimated Total Volume Pumped:</b> 6750 ml <b>Flow Cell Volume:</b> 130 ml <b>Final Flow Rate:</b> 150 ml/min <b>Final Draw Down:</b> 1.12 ft	<b>Instrument Used:</b> Aqua TROLL 600 Vented <b>Serial Number:</b> 469050
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## Test Notes:

**Weather Conditions:**  
 Sunny

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15 %		
3/20/2018 4:25 PM	00:00	6.80 pH	50.64 °F	1,391.8 µS/cm	3.65 mg/L	0.00 NTU	-90.1 mV	5.49 ft	150.00 ml/min
3/20/2018 4:28 PM	03:00	6.75 pH	49.86 °F	1,342.0 µS/cm	0.21 mg/L	0.00 NTU	-106.1 mV	5.49 ft	150.00 ml/min
3/20/2018 4:31 PM	06:00	6.74 pH	49.75 °F	1,342.8 µS/cm	0.18 mg/L	0.00 NTU	-112.5 mV	5.49 ft	150.00 ml/min
3/20/2018 4:34 PM	09:00	6.73 pH	49.68 °F	1,356.3 µS/cm	0.16 mg/L	0.00 NTU	-116.0 mV	5.49 ft	150.00 ml/min
3/20/2018 4:37 PM	12:00	6.73 pH	49.80 °F	1,362.6 µS/cm	0.14 mg/L	0.00 NTU	-118.5 mV	5.49 ft	150.00 ml/min
3/20/2018 4:40 PM	15:00	6.73 pH	49.91 °F	1,364.2 µS/cm	0.14 mg/L	0.00 NTU	-120.0 mV	5.49 ft	150.00 ml/min
3/20/2018 4:43 PM	18:00	6.72 pH	49.83 °F	1,370.1 µS/cm	0.13 mg/L	0.00 NTU	-121.0 mV	5.49 ft	150.00 ml/min
3/20/2018 4:46 PM	21:00	6.72 pH	49.80 °F	1,374.2 µS/cm	0.13 mg/L	0.00 NTU	-121.6 mV	5.49 ft	150.00 ml/min
3/20/2018 4:49 PM	24:00	6.72 pH	49.83 °F	1,376.7 µS/cm	0.12 mg/L	0.00 NTU	-122.1 mV	5.49 ft	150.00 ml/min
3/20/2018 4:52 PM	27:00	6.72 pH	49.90 °F	1,379.6 µS/cm	0.12 mg/L	0.00 NTU	-122.8 mV	5.49 ft	150.00 ml/min
3/20/2018 4:55 PM	30:00	6.72 pH	50.09 °F	1,367.7 µS/cm	0.12 mg/L	0.43 NTU	-123.6 mV	5.49 ft	150.00 ml/min
3/20/2018 4:58 PM	33:00	6.72 pH	50.11 °F	1,376.2 µS/cm	0.11 mg/L	0.10 NTU	-124.1 mV	5.49 ft	150.00 ml/min

3/20/2018 5:01 PM	36:00	6.72 pH	50.15 °F	1,365.2 µS/cm	0.11 mg/L	0.23 NTU	-124.5 mV	5.49 ft	150.00 ml/min
3/20/2018 5:04 PM	39:00	6.71 pH	50.18 °F	1,371.2 µS/cm	0.11 mg/L	0.54 NTU	-124.7 mV	5.49 ft	150.00 ml/min
3/20/2018 5:07 PM	42:00	6.71 pH	50.18 °F	1,366.5 µS/cm	0.11 mg/L	2.26 NTU	-124.9 mV	5.49 ft	150.00 ml/min
3/20/2018 5:10 PM	45:00	6.71 pH	50.15 °F	1,376.5 µS/cm	0.11 mg/L	1.39 NTU	-125.1 mV	5.49 ft	150.00 ml/min

## Samples

<b>Sample ID:</b>	<b>Description:</b>
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# Low-Flow Test Report:

Test Date / Time: 3/22/2018 9:36:14 AM

Project: Edmonds Terminal 1Q18

Operator Name: Patrick Collins

<b>Location Name: MW-139R</b> <b>Well Diameter: 2 in</b> <b>Casing Type: PVC</b> <b>Screen Length: 10 ft</b> <b>Top of Screen: 3 ft</b> <b>Total Depth: 13 ft</b> <b>Initial Depth to Water: 7.2 ft</b>	<b>Pump Type: Geotech geopump series 2</b> <b>Tubing Type: Polyethylene 0.170" x 1/4"</b> <b>Pump Intake From TOC: 10 ft</b> <b>Estimated Total Volume Pumped: 900 ml</b> <b>Flow Cell Volume: 130 ml</b> <b>Final Flow Rate: 150 ml/min</b> <b>Final Draw Down: 0 ft</b>	<b>Instrument Used: Aqua TROLL 600 Vented</b> <b>Serial Number: 469050</b>
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## Test Notes:

## Weather Conditions:

Raining. Cold

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15 %		
3/22/2018 9:36 AM	00:00	7.13 pH	50.75 °F	1,303.9 µS/cm	5.06 mg/L	7.10 NTU	134.7 mV	7.20 ft	150.00 ml/min
3/22/2018 9:39 AM	03:00	7.08 pH	49.22 °F	1,364.0 µS/cm	5.03 mg/L	1.26 NTU	136.8 mV	7.20 ft	150.00 ml/min
3/22/2018 9:42 AM	06:00	7.06 pH	48.73 °F	1,375.8 µS/cm	4.72 mg/L	0.02 NTU	138.0 mV	7.20 ft	150.00 ml/min

## Samples

Sample ID:	Description:
MW-139R	Sample time 0845

# Low-Flow Test Report:

Test Date / Time: 3/22/2018 8:34:47 AM

Project: Edmonds Terminal 1Q18

Operator Name: RB

<b>Location Name: MW-143</b> <b>Latitude: 47.8054565782632</b> <b>Longitude: -122.390312477946</b> <b>Well Diameter: 2 in</b> <b>Casing Type: PVC</b> <b>Screen Length: 10.1 ft</b> <b>Top of Screen: 3.5 ft</b> <b>Total Depth: 13.6 ft</b> <b>Initial Depth to Water: 3.78 ft</b>	<b>Pump Type: Geotech geopump Series 2</b> <b>Tubing Type: Polyethylene 0.17" x 0.25"</b> <b>Pump Intake From TOC: 10 ft</b> <b>Estimated Total Volume Pumped: 4500 ml</b> <b>Flow Cell Volume: 130 ml</b> <b>Final Flow Rate: 150 ml/min</b> <b>Final Draw Down: 2.97 ft</b>	<b>Instrument Used: Aqua TROLL 600 Vented</b> <b>Serial Number: 469079</b>
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## Test Notes:

Sample Time: 0905

Final DTW: 6.75' btoc

Final RDO: 0.43 mg/L

## Weather Conditions:

Heavy rain, 45F

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15 %		
3/22/2018 8:34 AM	00:00	7.05 pH	9.39 °C	133.28 µS/cm	1.00 mg/L	3.42 NTU	98.0 mV	3.78 ft	150.00 ml/min
3/22/2018 8:37 AM	03:00	6.99 pH	8.99 °C	132.75 µS/cm	0.91 mg/L	9.03 NTU	61.7 mV	3.78 ft	150.00 ml/min
3/22/2018 8:40 AM	06:00	6.96 pH	8.91 °C	141.89 µS/cm	0.79 mg/L	8.23 NTU	6.6 mV	3.78 ft	150.00 ml/min
3/22/2018 8:43 AM	09:00	6.81 pH	8.75 °C	175.80 µS/cm	0.64 mg/L	8.54 NTU	-39.2 mV	3.78 ft	150.00 ml/min
3/22/2018 8:46 AM	12:00	6.82 pH	8.77 °C	190.85 µS/cm	0.61 mg/L	6.93 NTU	-52.3 mV	3.78 ft	150.00 ml/min
3/22/2018 8:49 AM	15:00	6.77 pH	8.66 °C	246.99 µS/cm	0.47 mg/L	7.86 NTU	-66.6 mV	3.78 ft	150.00 ml/min
3/22/2018 8:52 AM	18:00	6.75 pH	8.69 °C	269.85 µS/cm	0.44 mg/L	5.34 NTU	-72.8 mV	3.78 ft	150.00 ml/min
3/22/2018 8:55 AM	21:00	6.73 pH	8.69 °C	286.59 µS/cm	0.40 mg/L	4.49 NTU	-76.9 mV	3.78 ft	150.00 ml/min
3/22/2018 8:58 AM	24:00	6.74 pH	8.76 °C	292.12 µS/cm	0.43 mg/L	4.04 NTU	-77.7 mV	3.78 ft	150.00 ml/min
3/22/2018 9:01 AM	27:00	6.75 pH	8.77 °C	292.38 µS/cm	0.44 mg/L	5.40 NTU	-79.8 mV	3.78 ft	150.00 ml/min
3/22/2018 9:04 AM	30:00	6.75 pH	8.82 °C	289.84 µS/cm	0.43 mg/L	3.68 NTU	-83.0 mV	3.78 ft	150.00 ml/min

**Samples**

Sample ID:	Description:
MW-143	905

# Low-Flow Test Report:

Test Date / Time: 3/21/2018 8:33:04 AM

Project: Edmonds Terminal 1Q18

Operator Name: RB

<b>Location Name: MW-502</b> <b>Latitude: 47.8056833423083</b> <b>Longitude: -122.388757131994</b> <b>Well Diameter: 2 in</b> <b>Casing Type: PVC</b> <b>Screen Length: 10 ft</b> <b>Top of Screen: 3 ft</b> <b>Total Depth: 13 ft</b> <b>Initial Depth to Water: 5.18 ft</b>	<b>Pump Type: Geotech geopump Series 2</b> <b>Tubing Type: Polyethylene 0.17" x 0.25"</b> <b>Pump Intake From TOC: 10 ft</b> <b>Estimated Total Volume Pumped: 2700 ml</b> <b>Flow Cell Volume: 130 ml</b> <b>Final Flow Rate: 150 ml/min</b> <b>Final Draw Down: 0 ft</b>	<b>Instrument Used: Aqua TROLL 600 Vented</b> <b>Serial Number: 469079</b>
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## Test Notes:

Sample Time: 0855

Final DTW: 5.51' btoc

Final RDO: mg/L

## Weather Conditions:

Partly sunny, 45F

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15	+/- 10 %	+/- 15 %		
3/21/2018 8:33 AM	00:00	7.02 pH	8.89 °C	303.19 µS/cm	3.73 mg/L	166.44 NTU	-27.4 mV	5.18 ft	150.00 ml/min
3/21/2018 8:36 AM	03:00	6.58 pH	9.13 °C	298.06 µS/cm	0.30 mg/L	93.85 NTU	36.4 mV	5.18 ft	150.00 ml/min
3/21/2018 8:39 AM	06:00	6.55 pH	9.15 °C	296.88 µS/cm	0.20 mg/L	30.00 NTU	42.9 mV	5.18 ft	150.00 ml/min
3/21/2018 8:42 AM	09:00	6.53 pH	9.16 °C	299.89 µS/cm	0.11 mg/L	24.86 NTU	45.9 mV	5.18 ft	150.00 ml/min
3/21/2018 8:45 AM	12:00	6.54 pH	9.17 °C	293.08 µS/cm	0.13 mg/L	23.84 NTU	48.7 mV	5.18 ft	150.00 ml/min
3/21/2018 8:48 AM	15:00	6.51 pH	9.21 °C	290.64 µS/cm	0.11 mg/L	16.70 NTU	50.9 mV	5.18 ft	150.00 ml/min
3/21/2018 8:51 AM	18:00	6.54 pH	9.23 °C	283.93 µS/cm	0.06 mg/L	13.84 NTU	50.7 mV	5.18 ft	150.00 ml/min

## Samples

Sample ID:	Description:
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MW-502	855
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# Low-Flow Test Report:

Test Date / Time: 3/21/2018 9:21:32 AM

Project: Edmonds Terminal 1Q18 (3)

Operator Name: RB

<b>Location Name: MW-503</b> <b>Latitude: 47.8060154924245</b> <b>Longitude: -122.388682365417</b> <b>Well Diameter: 2 in</b> <b>Casing Type: PVC</b> <b>Screen Length: 10 ft</b> <b>Top of Screen: 3 ft</b> <b>Total Depth: 13 ft</b> <b>Initial Depth to Water: 5.2 ft</b>	<b>Pump Type: Geotech geopump Series 2</b> <b>Tubing Type: Polyethylene 0.17" x 0.25"</b> <b>Pump Intake From TOC: 10 ft</b> <b>Estimated Total Volume Pumped: 6750 ml</b> <b>Flow Cell Volume: 130 ml</b> <b>Final Flow Rate: 150 ml/min</b> <b>Final Draw Down: 0.1 ft</b>	<b>Instrument Used: Aqua TROLL 600 Vented</b> <b>Serial Number: 469079</b>
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## Test Notes:

Sample Time: 1005

Final DTW: 5.30' btoc

Final RDO: 0.06 mg/L

## Weather Conditions:

Overcast 45F

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15 %		
3/21/2018 9:21 AM	00:00	6.58 pH	10.57 °C	512.54 µS/cm	0.49 mg/L	12.91 NTU	9.6 mV	5.20 ft	150.00 ml/min
3/21/2018 9:24 AM	03:00	6.56 pH	10.86 °C	502.67 µS/cm	0.23 mg/L	102.97 NTU	-7.5 mV	5.20 ft	150.00 ml/min
3/21/2018 9:27 AM	06:00	6.56 pH	10.90 °C	503.10 µS/cm	0.23 mg/L	238.23 NTU	-10.4 mV	5.20 ft	150.00 ml/min
3/21/2018 9:30 AM	09:00	6.56 pH	10.86 °C	501.44 µS/cm	0.17 mg/L	30.55 NTU	-21.0 mV	5.20 ft	150.00 ml/min
3/21/2018 9:33 AM	12:00	6.57 pH	10.82 °C	493.50 µS/cm	0.11 mg/L	3.29 NTU	-25.6 mV	5.20 ft	150.00 ml/min
3/21/2018 9:36 AM	15:00	6.54 pH	10.90 °C	499.55 µS/cm	0.10 mg/L	0.38 NTU	-27.6 mV	5.20 ft	150.00 ml/min
3/21/2018 9:39 AM	18:00	6.52 pH	10.94 °C	499.00 µS/cm	0.11 mg/L	0.00 NTU	-29.9 mV	5.20 ft	150.00 ml/min
3/21/2018 9:42 AM	21:00	6.53 pH	10.99 °C	504.37 µS/cm	0.09 mg/L	0.00 NTU	-33.5 mV	5.20 ft	150.00 ml/min
3/21/2018 9:45 AM	24:00	6.53 pH	10.98 °C	502.49 µS/cm	0.09 mg/L	0.00 NTU	-35.2 mV	5.20 ft	150.00 ml/min
3/21/2018 9:48 AM	27:00	6.54 pH	11.06 °C	501.42 µS/cm	0.07 mg/L	0.00 NTU	-38.9 mV	5.20 ft	150.00 ml/min
3/21/2018 9:51 AM	30:00	6.54 pH	10.92 °C	497.36 µS/cm	0.07 mg/L	0.00 NTU	-41.5 mV	5.20 ft	150.00 ml/min

3/21/2018 9:54 AM	33:00	6.55 pH	11.02 °C	498.46 µS/cm	0.06 mg/L	0.00 NTU	-43.2 mV	5.20 ft	150.00 ml/min
3/21/2018 9:57 AM	36:00	6.54 pH	11.06 °C	504.76 µS/cm	0.06 mg/L	0.00 NTU	-46.1 mV	5.20 ft	150.00 ml/min
3/21/2018 10:00 AM	39:00	6.53 pH	11.06 °C	500.74 µS/cm	0.06 mg/L	0.00 NTU	-48.0 mV	5.20 ft	150.00 ml/min
3/21/2018 10:03 AM	42:00	6.54 pH	11.08 °C	502.94 µS/cm	0.04 mg/L	0.00 NTU	-49.6 mV	5.20 ft	150.00 ml/min
3/21/2018 10:06 AM	45:00	6.53 pH	11.12 °C	499.87 µS/cm	0.06 mg/L	0.00 NTU	-50.4 mV	5.20 ft	150.00 ml/min

## Samples

Sample ID:	Description:
MW-503	1005

# Low-Flow Test Report:

**Test Date / Time:** 3/21/2018 11:31:08 AM

**Project:** Edmonds Terminal 1Q18 (2) (2) (2) (2) (2) (2)

**Operator Name:** EK

<p><b>Location Name: MW-504</b>  <b>Well Diameter: 2 in</b>  <b>Casing Type: PVC</b>  <b>Screen Length: 10 ft</b>  <b>Top of Screen: 3 ft</b>  <b>Total Depth: 13 ft</b>  <b>Initial Depth to Water: 6.7 ft</b></p>	<p><b>Pump Type: Geotech geopump series 2</b>  <b>Tubing Type: Polyethylene 0.170 x 1/4"</b>  <b>Pump Intake From TOC: 9.5 ft</b>  <b>Estimated Total Volume Pumped: 5400 ml</b>  <b>Flow Cell Volume: 130 ml</b>  <b>Final Flow Rate: 150 ml/min</b>  <b>Final Draw Down: 0 ft</b></p>	<p><b>Instrument Used: Aqua TROLL 600 Vented</b>  <b>Serial Number: 457166</b></p>
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## Test Notes:

## Weather Conditions:

Sunny and 45

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15 %		
3/21/2018 11:31 AM	00:00	6.93 pH	50.14 °F	3,493.3 µS/cm	1.04 mg/L	21.06 NTU	134.9 mV	6.70 ft	150.00 ml/min
3/21/2018 11:34 AM	03:00	6.92 pH	49.93 °F	3,481.1 µS/cm	0.28 mg/L	18.35 NTU	101.1 mV	6.70 ft	150.00 ml/min
3/21/2018 11:37 AM	06:00	6.92 pH	49.84 °F	3,512.0 µS/cm	0.27 mg/L	17.64 NTU	79.3 mV	6.70 ft	150.00 ml/min
3/21/2018 11:40 AM	09:00	6.92 pH	49.83 °F	3,479.4 µS/cm	0.38 mg/L	16.42 NTU	63.0 mV	6.70 ft	150.00 ml/min
3/21/2018 11:43 AM	12:00	6.94 pH	49.78 °F	3,316.7 µS/cm	0.65 mg/L	10.38 NTU	53.3 mV	6.70 ft	150.00 ml/min
3/21/2018 11:46 AM	15:00	6.96 pH	49.68 °F	3,172.1 µS/cm	1.07 mg/L	6.45 NTU	48.3 mV	6.70 ft	150.00 ml/min
3/21/2018 11:49 AM	18:00	7.00 pH	49.62 °F	2,842.3 µS/cm	1.81 mg/L	4.37 NTU	47.2 mV	6.70 ft	150.00 ml/min
3/21/2018 11:52 AM	21:00	7.04 pH	49.58 °F	2,493.2 µS/cm	2.70 mg/L	1.53 NTU	49.2 mV	6.70 ft	150.00 ml/min
3/21/2018 11:55 AM	24:00	7.07 pH	49.47 °F	2,253.9 µS/cm	3.36 mg/L	1.52 NTU	53.8 mV	6.70 ft	150.00 ml/min
3/21/2018 11:58 AM	27:00	7.10 pH	49.54 °F	2,154.4 µS/cm	3.81 mg/L	0.00 NTU	59.0 mV	6.70 ft	150.00 ml/min
3/21/2018 12:01 PM	30:00	7.12 pH	49.53 °F	2,052.1 µS/cm	4.17 mg/L	0.00 NTU	63.9 mV	6.70 ft	150.00 ml/min
3/21/2018 12:04 PM	33:00	7.13 pH	49.58 °F	1,958.3 µS/cm	4.36 mg/L	0.00 NTU	69.2 mV	6.70 ft	150.00 ml/min

3/21/2018 12:07 PM	36:00	7.14 pH	49.63 °F	1,911.5 μS/cm	4.41 mg/L	0.00 NTU	73.8 mV	6.70 ft	150.00 ml/min
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## Samples

Sample ID:	Description:
MW-504	Sample time: 1110 Final DTW: 6.70 ft btoc Final RDO: 4.41 mg/L

# Low-Flow Test Report:

Test Date / Time: 3/21/2018 10:39:29 AM

Project: Edmonds Terminal 1Q18

Operator Name: RB

<b>Location Name: MW-505</b> <b>Latitude: 47.8062602688117</b> <b>Longitude: -122.389055192471</b> <b>Well Diameter: 2 in</b> <b>Casing Type: PVC</b> <b>Screen Length: 10 ft</b> <b>Top of Screen: 13 ft</b> <b>Total Depth: 3 ft</b> <b>Initial Depth to Water: 4.78 ft</b>	<b>Pump Type: Geotech geopump Series 2</b> <b>Tubing Type: Polyethylene 0.17" x 0.25"</b> <b>Pump Intake From TOC: 10 ft</b> <b>Estimated Total Volume Pumped: 6750 ml</b> <b>Flow Cell Volume: 130 ml</b> <b>Final Flow Rate: 150 ml/min</b> <b>Final Draw Down: 0 ft</b>	<b>Instrument Used: Aqua TROLL 600 Vented</b> <b>Serial Number: 469079</b>
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## Test Notes:

Sample Time: 1125

Final DTW: 4.80' btoc

Final RDO: 0.05 mg/L

## Weather Conditions:

Sunny, 50F

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15 %		
3/21/2018 10:39 AM	00:00	6.77 pH	11.12 °C	421.29 µS/cm	3.62 mg/L	42.13 NTU	6.9 mV	4.78 ft	150.00 ml/min
3/21/2018 10:42 AM	03:00	6.76 pH	11.15 °C	435.96 µS/cm	0.30 mg/L	12.44 NTU	-42.8 mV	4.78 ft	150.00 ml/min
3/21/2018 10:45 AM	06:00	6.74 pH	11.14 °C	535.79 µS/cm	0.17 mg/L	12.80 NTU	-59.9 mV	4.78 ft	150.00 ml/min
3/21/2018 10:48 AM	09:00	6.75 pH	11.10 °C	669.38 µS/cm	0.13 mg/L	8.27 NTU	-68.7 mV	4.78 ft	150.00 ml/min
3/21/2018 10:51 AM	12:00	6.75 pH	11.09 °C	988.07 µS/cm	0.10 mg/L	7.56 NTU	-75.7 mV	4.78 ft	150.00 ml/min
3/21/2018 10:54 AM	15:00	6.77 pH	11.08 °C	1,063.1 µS/cm	0.08 mg/L	7.06 NTU	-80.2 mV	4.78 ft	150.00 ml/min
3/21/2018 10:57 AM	18:00	6.77 pH	11.05 °C	1,256.8 µS/cm	0.07 mg/L	5.43 NTU	-83.9 mV	4.78 ft	150.00 ml/min
3/21/2018 11:00 AM	21:00	6.77 pH	11.09 °C	1,410.5 µS/cm	0.06 mg/L	4.05 NTU	-86.7 mV	4.78 ft	150.00 ml/min
3/21/2018 11:03 AM	24:00	6.77 pH	11.10 °C	1,460.9 µS/cm	0.06 mg/L	4.08 NTU	-90.7 mV	4.78 ft	150.00 ml/min
3/21/2018 11:06 AM	27:00	6.79 pH	11.09 °C	1,653.7 µS/cm	0.07 mg/L	2.31 NTU	-90.8 mV	4.78 ft	150.00 ml/min
3/21/2018 11:09 AM	30:00	6.79 pH	11.12 °C	1,729.2 µS/cm	0.04 mg/L	4.25 NTU	-92.1 mV	4.78 ft	150.00 ml/min

3/21/2018 11:12 AM	33:00	6.80 pH	11.10 °C	1,748.7 µS/cm	0.06 mg/L	3.22 NTU	-92.8 mV	4.78 ft	150.00 ml/min
3/21/2018 11:15 AM	36:00	6.81 pH	11.13 °C	1,941.4 µS/cm	0.06 mg/L	0.55 NTU	-94.3 mV	4.78 ft	150.00 ml/min
3/21/2018 11:18 AM	39:00	6.82 pH	11.18 °C	2,037.9 µS/cm	0.06 mg/L	1.40 NTU	-96.8 mV	4.78 ft	150.00 ml/min
3/21/2018 11:21 AM	42:00	6.83 pH	11.17 °C	1,975.5 µS/cm	0.05 mg/L	0.65 NTU	-98.4 mV	4.78 ft	150.00 ml/min
3/21/2018 11:24 AM	45:00	6.83 pH	11.10 °C	2,015.5 µS/cm	0.05 mg/L	0.27 NTU	-98.7 mV	4.78 ft	150.00 ml/min

## Samples

Sample ID:	Description:
MW-505	1125

# Low-Flow Test Report:

**Test Date / Time:** 3/21/2018 10:07:21 AM

**Project:** Edmonds Terminal 1Q18 (2) (2) (2) (2) (2) (2)

**Operator Name:** EK

<b>Location Name: MW-506</b> <b>Well Diameter: 2 in</b> <b>Casing Type: PVC</b> <b>Screen Length: 10 ft</b> <b>Top of Screen: 3 ft</b> <b>Total Depth: 13 ft</b> <b>Initial Depth to Water: 6.8 ft</b>	<b>Pump Type: Geotech geopump series 2</b> <b>Tubing Type: Polyethylene 0.170 x 1/4"</b> <b>Pump Intake From TOC: 9.5 ft</b> <b>Estimated Total Volume Pumped: 6750 ml</b> <b>Flow Cell Volume: 130 ml</b> <b>Final Flow Rate: 150 ml/min</b> <b>Final Draw Down: 0.12 ft</b>	<b>Instrument Used: Aqua TROLL 600 Vented</b> <b>Serial Number: 457166</b>
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## Test Notes:

## Weather Conditions:

Sunny and 40

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15 %		
3/21/2018 10:07 AM	00:00	7.17 pH	49.14 °F	468.97 µS/cm	0.38 mg/L	259.83 NTU	216.2 mV	6.80 ft	150.00 ml/min
3/21/2018 10:10 AM	03:00	7.17 pH	49.21 °F	491.40 µS/cm	0.17 mg/L	51.78 NTU	173.7 mV	6.80 ft	150.00 ml/min
3/21/2018 10:13 AM	06:00	7.16 pH	49.22 °F	502.16 µS/cm	0.20 mg/L	26.15 NTU	146.4 mV	6.80 ft	150.00 ml/min
3/21/2018 10:16 AM	09:00	7.16 pH	49.20 °F	502.34 µS/cm	0.15 mg/L	11.87 NTU	125.7 mV	6.80 ft	150.00 ml/min
3/21/2018 10:19 AM	12:00	7.16 pH	49.21 °F	501.30 µS/cm	0.13 mg/L	11.29 NTU	104.9 mV	6.80 ft	150.00 ml/min
3/21/2018 10:22 AM	15:00	7.16 pH	49.25 °F	501.47 µS/cm	0.16 mg/L	6.80 NTU	84.5 mV	6.80 ft	150.00 ml/min
3/21/2018 10:25 AM	18:00	7.16 pH	49.18 °F	500.77 µS/cm	0.21 mg/L	3.43 NTU	66.8 mV	6.80 ft	150.00 ml/min
3/21/2018 10:28 AM	21:00	7.18 pH	49.22 °F	505.58 µS/cm	0.63 mg/L	9.16 NTU	51.2 mV	6.80 ft	150.00 ml/min
3/21/2018 10:31 AM	24:00	7.19 pH	49.26 °F	496.50 µS/cm	0.96 mg/L	11.52 NTU	38.3 mV	6.80 ft	150.00 ml/min
3/21/2018 10:34 AM	27:00	7.17 pH	49.11 °F	501.67 µS/cm	0.26 mg/L	13.14 NTU	28.6 mV	6.80 ft	150.00 ml/min
3/21/2018 10:37 AM	30:00	7.17 pH	49.23 °F	501.54 µS/cm	0.28 mg/L	2.33 NTU	20.2 mV	6.80 ft	150.00 ml/min
3/21/2018 10:40 AM	33:00	7.17 pH	49.30 °F	502.57 µS/cm	0.22 mg/L	3.93 NTU	13.2 mV	6.80 ft	150.00 ml/min



3/21/2018 10:43 AM	36:00	7.16 pH	49.35 °F	501.98 µS/cm	0.22 mg/L	1.44 NTU	7.4 mV	6.80 ft	150.00 ml/min
3/21/2018 10:46 AM	39:00	7.17 pH	49.29 °F	502.41 µS/cm	0.17 mg/L	0.13 NTU	2.7 mV	6.80 ft	150.00 ml/min
3/21/2018 10:49 AM	42:00	7.17 pH	49.23 °F	501.13 µS/cm	0.23 mg/L	0.17 NTU	-1.2 mV	6.80 ft	150.00 ml/min
3/21/2018 10:52 AM	45:00	7.17 pH	49.25 °F	499.96 µS/cm	0.16 mg/L	0.00 NTU	-4.8 mV	6.80 ft	150.00 ml/min

## Samples

Sample ID:	Description:
MW-506	Sample time 1000 Final DTW: 6.91 ft btoc Final RDO: 0.16 mg/L RDO didn't stabilize
DUP-2	

# Low-Flow Test Report:

Test Date / Time: 3/21/2018 9:27:33 AM

Project: Edmonds Terminal 1Q18 (2) (2) (2) (2)

Operator Name: EK

<b>Location Name: MW-507</b> <b>Well Diameter: 2 in</b> <b>Casing Type: PVC</b> <b>Screen Length: 10 ft</b> <b>Top of Screen: 3 ft</b> <b>Total Depth: 13 ft</b> <b>Initial Depth to Water: 6.92 ft</b>	<b>Pump Type: Geotech geopump series 2</b> <b>Tubing Type: Polyethylene 0.170 x 1/4"</b> <b>Pump Intake From TOC: 9.5 ft</b> <b>Estimated Total Volume Pumped: 1350 ml</b> <b>Flow Cell Volume: 130 ml</b> <b>Final Flow Rate: 150 ml/min</b> <b>Final Draw Down: 0.2 ft</b>	<b>Instrument Used: Aqua TROLL 600 Vented</b> <b>Serial Number: 457166</b>
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## Test Notes:

## Weather Conditions:

Sunny and 40

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15 %		
3/21/2018 9:27 AM	00:00	6.99 pH	48.74 °F	802.74 µS/cm	3.08 mg/L	211.96 NTU	235.4 mV	6.92 ft	150.00 ml/min
3/21/2018 9:30 AM	03:00	7.01 pH	49.02 °F	791.20 µS/cm	2.73 mg/L	100.75 NTU	234.3 mV	6.92 ft	150.00 ml/min
3/21/2018 9:33 AM	06:00	7.00 pH	49.29 °F	759.13 µS/cm	2.34 mg/L	81.54 NTU	235.8 mV	6.92 ft	150.00 ml/min
3/21/2018 9:36 AM	09:00	6.99 pH	49.19 °F	799.40 µS/cm	2.63 mg/L	54.69 NTU	238.0 mV	6.92 ft	150.00 ml/min

## Samples

Sample ID:	Description:
MW-507	Sample time 0840 Final DTW: 7.12 ft btoc Final RDO: 2.71 mg/L

# Low-Flow Test Report:

**Test Date / Time:** 3/21/2018 9:32:33 AM

**Project:** Edmonds Terminal 1Q18

**Operator Name:** Patrick Collins

<b>Location Name: MW-509</b> <b>Well Diameter: 2 in</b> <b>Casing Type: PVC</b> <b>Screen Length: 10 m</b> <b>Top of Screen: 3 m</b> <b>Total Depth: 13 m</b> <b>Initial Depth to Water: 3.63 ft</b>	<b>Pump Type: Geotech geopump series 2</b> <b>Tubing Type: Polyethylene 0.170" x 1/4"</b> <b>Pump Intake From TOC: 8.5 ft</b> <b>Estimated Total Volume Pumped: 900 ml</b> <b>Flow Cell Volume: 130 ml</b> <b>Final Flow Rate: 150 ml/min</b> <b>Final Draw Down: 0 ft</b>	<b>Instrument Used: Aqua TROLL 600 Vented</b> <b>Serial Number: 469050</b>
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## Test Notes:

Sample time 0845. Turbidity sensor malfunction.

## Weather Conditions:

Sunny. Cool

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15 %		
3/21/2018 9:32 AM	00:00	9.06 pH	48.12 °F	0.38 µS/cm	11.48 mg/L	0.00 NTU	146.2 mV	3.63 ft	150.00 ml/min
3/21/2018 9:35 AM	03:00	8.48 pH	48.79 °F	0.38 µS/cm	11.38 mg/L	0.00 NTU	150.9 mV	3.63 ft	150.00 ml/min
3/21/2018 9:38 AM	06:00	8.65 pH	48.85 °F	0.38 µS/cm	11.36 mg/L	0.00 NTU	148.3 mV	3.63 ft	150.00 ml/min

## Samples

Sample ID:	Description:
MW-509	Sample Time 0845

# Low-Flow Test Report:

Test Date / Time: 3/21/2018 2:09:48 PM

Project: Edmonds Terminal 1Q18 (2)

Operator Name: EK

<b>Location Name: MW-511</b> <b>Well Diameter: 2 in</b> <b>Casing Type: PVC</b> <b>Screen Length: 10 ft</b> <b>Top of Screen: 5 ft</b> <b>Total Depth: 15 ft</b> <b>Initial Depth to Water: 7.9 ft</b>	<b>Pump Type: Geotech geopump series 2</b> <b>Tubing Type: Polyethylene 0.170 x 1/4"</b> <b>Pump Intake From TOC: 10 ft</b> <b>Estimated Total Volume Pumped: 900 ml</b> <b>Flow Cell Volume: 130 ml</b> <b>Final Flow Rate: 150 ml/min</b> <b>Final Draw Down: 0.01 ft</b>	<b>Instrument Used: Aqua TROLL 600 Vented</b> <b>Serial Number: 457166</b>
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## Test Notes:

## Weather Conditions:

Sunny and 45

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15 %		
3/21/2018 2:09 PM	00:00	6.49 pH	50.12 °F	209.46 µS/cm	3.88 mg/L	6.75 NTU	168.5 mV	7.90 ft	150.00 ml/min
3/21/2018 2:12 PM	03:00	6.50 pH	49.99 °F	224.28 µS/cm	3.91 mg/L	1.66 NTU	181.5 mV	7.90 ft	150.00 ml/min
3/21/2018 2:15 PM	06:00	6.47 pH	49.82 °F	225.31 µS/cm	3.63 mg/L	2.45 NTU	190.8 mV	7.90 ft	150.00 ml/min

## Samples

Sample ID:	Description:
MW-511	Sample time: 1320 Final DTW: 7.91 ft btoc Final RDO: 3.59 mg/L

# Low-Flow Test Report:

**Test Date / Time:** 3/21/2018 12:47:59 PM

**Project:** Edmonds Terminal 1Q18

**Operator Name:** EK

<p><b>Location Name: MW-512</b>  <b>Well Diameter: 2 in</b>  <b>Casing Type: PVC</b>  <b>Screen Length: 10 ft</b>  <b>Top of Screen: 3 ft</b>  <b>Total Depth: 13 ft</b>  <b>Initial Depth to Water: 6.6 ft</b></p>	<p><b>Pump Type: Geotech geopump series 2</b>  <b>Tubing Type: Polyethylene 0.170 x 1/4"</b>  <b>Pump Intake From TOC: 9 ft</b>  <b>Estimated Total Volume Pumped: 6750 ml</b>  <b>Flow Cell Volume: 130 ml</b>  <b>Final Flow Rate: 150 ml/min</b>  <b>Final Draw Down: 0.05 ft</b></p>	<p><b>Instrument Used: Aqua TROLL 600 Vented</b>  <b>Serial Number: 457166</b></p>
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## Test Notes:

## Weather Conditions:

Sunny and 45

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15 %		
3/21/2018 12:47 PM	00:00	7.22 pH	49.73 °F	520.29 µS/cm	0.47 mg/L	207.85 NTU	137.5 mV	6.60 ft	150.00 ml/min
3/21/2018 12:50 PM	03:00	7.21 pH	49.58 °F	542.48 µS/cm	0.54 mg/L	71.34 NTU	89.6 mV	6.60 ft	150.00 ml/min
3/21/2018 12:53 PM	06:00	7.20 pH	49.45 °F	543.32 µS/cm	0.43 mg/L	51.72 NTU	58.9 mV	6.60 ft	150.00 ml/min
3/21/2018 12:56 PM	09:00	7.19 pH	49.40 °F	539.60 µS/cm	0.29 mg/L	33.80 NTU	37.8 mV	6.60 ft	150.00 ml/min
3/21/2018 12:59 PM	12:00	7.19 pH	49.34 °F	531.12 µS/cm	0.26 mg/L	22.79 NTU	22.6 mV	6.60 ft	150.00 ml/min
3/21/2018 1:02 PM	15:00	7.19 pH	49.41 °F	510.16 µS/cm	0.28 mg/L	16.37 NTU	12.3 mV	6.60 ft	150.00 ml/min
3/21/2018 1:05 PM	18:00	7.18 pH	49.33 °F	461.56 µS/cm	0.26 mg/L	8.57 NTU	5.9 mV	6.60 ft	150.00 ml/min
3/21/2018 1:08 PM	21:00	7.16 pH	49.31 °F	410.51 µS/cm	0.30 mg/L	3.60 NTU	3.4 mV	6.60 ft	150.00 ml/min
3/21/2018 1:11 PM	24:00	7.15 pH	49.21 °F	373.85 µS/cm	0.34 mg/L	1.21 NTU	3.6 mV	6.60 ft	150.00 ml/min
3/21/2018 1:14 PM	27:00	7.14 pH	49.36 °F	364.05 µS/cm	0.45 mg/L	0.29 NTU	4.8 mV	6.60 ft	150.00 ml/min
3/21/2018 1:17 PM	30:00	7.14 pH	49.28 °F	356.02 µS/cm	0.35 mg/L	3.53 NTU	5.6 mV	6.60 ft	150.00 ml/min
3/21/2018 1:20 PM	33:00	7.12 pH	49.38 °F	332.50 µS/cm	0.38 mg/L	0.00 NTU	6.8 mV	6.60 ft	150.00 ml/min

3/21/2018 1:23 PM	36:00	7.10 pH	49.35 °F	322.78 µS/cm	0.36 mg/L	0.00 NTU	9.2 mV	6.60 ft	150.00 ml/min
3/21/2018 1:26 PM	39:00	7.10 pH	49.35 °F	313.66 µS/cm	0.39 mg/L	0.00 NTU	11.2 mV	6.60 ft	150.00 ml/min
3/21/2018 1:29 PM	42:00	7.09 pH	49.32 °F	305.72 µS/cm	0.43 mg/L	0.00 NTU	13.6 mV	6.60 ft	150.00 ml/min
3/21/2018 1:32 PM	45:00	7.09 pH	49.30 °F	305.81 µS/cm	0.42 mg/L	0.00 NTU	15.8 mV	6.60 ft	150.00 ml/min

## Samples

Sample ID:	Description:
MW-512	Sample time: 1240 Final DTW: 6.65 ft btoc Final RDO: 0.42 mg/L ORP didn't stabilize
DUP-3	

# Low-Flow Test Report:

Test Date / Time: 3/21/2018 11:54:21 AM

Project: Edmonds Terminal 1Q18

Operator Name: RB

<b>Location Name: MW-513</b> <b>Latitude: 47.8060976851762</b> <b>Longitude: -122.389732450247</b> <b>Well Diameter: 2 in</b> <b>Casing Type: PVC</b> <b>Screen Length: 10 ft</b> <b>Top of Screen: 3 ft</b> <b>Total Depth: 13 ft</b> <b>Initial Depth to Water: 4.48 ft</b>	<b>Pump Type: Geotech geopump Series 2</b> <b>Tubing Type: Polyethylene 0.17" x 0.25"</b> <b>Pump Intake From TOC: 10 ft</b> <b>Estimated Total Volume Pumped: 6750 ml</b> <b>Flow Cell Volume: 130 ml</b> <b>Final Flow Rate: 150 ml/min</b> <b>Final Draw Down: 0 ft</b>	<b>Instrument Used: Aqua TROLL 600 Vented</b> <b>Serial Number: 469079</b>
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## Test Notes:

Sample Time: 1245

Final DTW: 4.48' btoc

Final RDO: 1.14 mg/L

Conductivity, RDO, and ORP did not stabilize after 45 minutes.

## Weather Conditions:

Sunny 50F

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15 %		
3/21/2018 11:54 AM	00:00	6.78 pH	11.07 °C	2,765.8 µS/cm	0.32 mg/L	26.08 NTU	-53.8 mV	4.48 ft	150.00 ml/min
3/21/2018 11:57 AM	03:00	6.78 pH	10.87 °C	2,773.7 µS/cm	0.14 mg/L	15.41 NTU	-77.5 mV	4.48 ft	150.00 ml/min
3/21/2018 12:00 PM	06:00	6.78 pH	10.79 °C	2,788.4 µS/cm	0.08 mg/L	9.66 NTU	-87.1 mV	4.48 ft	150.00 ml/min
3/21/2018 12:03 PM	09:00	6.79 pH	10.85 °C	2,761.2 µS/cm	0.08 mg/L	26.36 NTU	-93.1 mV	4.48 ft	150.00 ml/min
3/21/2018 12:06 PM	12:00	6.78 pH	11.18 °C	2,769.9 µS/cm	0.12 mg/L	8.04 NTU	-96.9 mV	4.48 ft	150.00 ml/min
3/21/2018 12:09 PM	15:00	6.77 pH	11.39 °C	2,754.4 µS/cm	0.10 mg/L	7.03 NTU	-99.8 mV	4.48 ft	150.00 ml/min
3/21/2018 12:12 PM	18:00	6.77 pH	11.67 °C	2,760.1 µS/cm	0.10 mg/L	5.30 NTU	-103.0 mV	4.48 ft	150.00 ml/min
3/21/2018 12:15 PM	21:00	6.77 pH	11.43 °C	2,736.6 µS/cm	0.07 mg/L	7.34 NTU	-106.2 mV	4.48 ft	150.00 ml/min
3/21/2018 12:18 PM	24:00	6.77 pH	11.43 °C	2,741.4 µS/cm	0.05 mg/L	5.86 NTU	-109.6 mV	4.48 ft	150.00 ml/min
3/21/2018 12:21 PM	27:00	6.77 pH	11.50 °C	2,740.3 µS/cm	0.05 mg/L	4.03 NTU	-112.7 mV	4.48 ft	150.00 ml/min

3/21/2018 12:24 PM	30:00	6.77 pH	11.51 °C	2,728.3 µS/cm	0.06 mg/L	3.72 NTU	-114.3 mV	4.48 ft	150.00 ml/min
3/21/2018 12:27 PM	33:00	6.77 pH	11.56 °C	2,720.7 µS/cm	0.06 mg/L	3.01 NTU	-116.5 mV	4.48 ft	150.00 ml/min
3/21/2018 12:30 PM	36:00	6.77 pH	11.51 °C	2,641.2 µS/cm	0.13 mg/L	6.87 NTU	-111.9 mV	4.48 ft	150.00 ml/min
3/21/2018 12:33 PM	39:00	6.77 pH	11.63 °C	2,556.3 µS/cm	0.33 mg/L	7.66 NTU	-94.9 mV	4.48 ft	150.00 ml/min
3/21/2018 12:36 PM	42:00	6.78 pH	11.48 °C	2,373.7 µS/cm	0.61 mg/L	10.81 NTU	-82.1 mV	4.48 ft	150.00 ml/min
3/21/2018 12:39 PM	45:00	6.78 pH	11.22 °C	2,189.7 µS/cm	1.11 mg/L	13.14 NTU	-61.7 mV	4.48 ft	150.00 ml/min

## Samples

Sample ID:	Description:
MW-513	1245



# Low-Flow Test Report:

Test Date / Time: 3/21/2018 1:23:24 PM

Project: Edmonds Terminal 1Q18

Operator Name: RB

<b>Location Name: MW-514</b> <b>Latitude: 47.8059060520106</b> <b>Longitude: -122.389903105795</b> <b>Well Diameter: 2 in</b> <b>Casing Type: PVC</b> <b>Screen Length: 10 ft</b> <b>Top of Screen: 3 ft</b> <b>Total Depth: 13 ft</b> <b>Initial Depth to Water: 4.78 ft</b>	<b>Pump Type: Geotech geopump Series 2</b> <b>Tubing Type: Polyethylene 0.17" x 0.25"</b> <b>Pump Intake From TOC: 10 ft</b> <b>Flow Cell Volume: 130 ml</b> <b>Final Flow Rate: 150 ml/min</b> <b>Final Draw Down: 0 ft</b>	<b>Instrument Used: Aqua TROLL 600 Vented</b> <b>Serial Number: 469079</b>
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## Test Notes:

Sample Time: 1410

Final DTW: 4.78' btoc

Final RDO: 0.60 mg/L

Conductivity, RDO, and ORP did not stabilize after 45 minutes.

## Weather Conditions:

Sunny 52F

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15 %		
3/21/2018 1:23 PM	00:00	6.58 pH	16.67 °C	1,676.0 µS/cm	1.80 mg/L	13.24 NTU	45.1 mV	4.78 ft	150.00 ml/min
3/21/2018 1:26 PM	03:00	6.58 pH	13.55 °C	1,763.4 µS/cm	0.25 mg/L	7.09 NTU	26.8 mV	4.78 ft	150.00 ml/min
3/21/2018 1:29 PM	06:00	6.58 pH	13.59 °C	1,822.8 µS/cm	0.22 mg/L	7.60 NTU	21.6 mV	4.78 ft	150.00 ml/min
3/21/2018 1:32 PM	09:00	6.61 pH	12.50 °C	1,790.7 µS/cm	0.09 mg/L	9.97 NTU	19.6 mV	4.78 ft	150.00 ml/min
3/21/2018 1:35 PM	12:00	6.61 pH	12.14 °C	1,791.6 µS/cm	0.11 mg/L	2.26 NTU	15.9 mV	4.78 ft	150.00 ml/min
3/21/2018 1:38 PM	15:00	6.62 pH	11.89 °C	1,813.8 µS/cm	0.08 mg/L	1.81 NTU	12.9 mV	4.78 ft	150.00 ml/min
3/21/2018 1:41 PM	18:00	6.62 pH	12.36 °C	1,785.0 µS/cm	0.15 mg/L	3.16 NTU	17.5 mV	4.78 ft	150.00 ml/min
3/21/2018 1:44 PM	21:00	6.62 pH	11.86 °C	1,838.0 µS/cm	0.09 mg/L	0.71 NTU	12.0 mV	4.78 ft	150.00 ml/min
3/21/2018 1:47 PM	24:00	6.62 pH	11.64 °C	1,798.0 µS/cm	0.05 mg/L	0.86 NTU	12.0 mV	4.78 ft	150.00 ml/min
3/21/2018 1:50 PM	27:00	6.63 pH	11.53 °C	1,782.3 µS/cm	0.04 mg/L	1.77 NTU	10.0 mV	4.78 ft	150.00 ml/min
3/21/2018 1:53 PM	30:00	6.64 pH	11.28 °C	1,833.3 µS/cm	0.03 mg/L	0.17 NTU	8.8 mV	4.78 ft	150.00 ml/min

3/21/2018 1:56 PM	33:00	6.64 pH	11.45 °C	1,762.0 µS/cm	0.05 mg/L	0.39 NTU	9.7 mV	4.78 ft	150.00 ml/min
3/21/2018 1:59 PM	36:00	6.64 pH	11.37 °C	1,695.5 µS/cm	0.12 mg/L	2.21 NTU	13.4 mV	4.78 ft	150.00 ml/min
3/21/2018 2:02 PM	39:00	6.65 pH	11.29 °C	1,600.9 µS/cm	0.23 mg/L	0.00 NTU	20.8 mV	4.78 ft	150.00 ml/min
3/21/2018 2:05 PM	42:00	6.65 pH	11.26 °C	1,502.2 µS/cm	0.41 mg/L	0.34 NTU	29.7 mV	4.78 ft	150.00 ml/min
3/21/2018 2:08 PM	45:00	6.67 pH	11.27 °C	1,410.0 µS/cm	0.60 mg/L	0.00 NTU	35.9 mV	4.78 ft	150.00 ml/min

## Samples

Sample ID:	Description:
MW-514	1410

MW-515

Sample time 0945

Created using VuSitu from In-Situ, Inc.

# Low-Flow Test Report:

Test Date / Time: 3/21/2018 10:18:26 AM

Project: Edmonds Terminal 1Q18

Operator Name: Patrick Collins

<b>Location Name: MW-515</b> <b>Well Diameter: 2 in</b> <b>Casing Type: PVC</b> <b>Screen Length: 10 ft</b> <b>Top of Screen: 3 ft</b> <b>Total Depth: 13 ft</b> <b>Initial Depth to Water: 4.97 ft</b>	<b>Pump Type: Geotech geopump series 2</b> <b>Tubing Type: Polyethylene 0.170" x 1/4"</b> <b>Pump Intake From TOC: 8 ft</b> <b>Estimated Total Volume Pumped: 3600 ml</b> <b>Flow Cell Volume: 130 ml</b> <b>Final Flow Rate: 150 ml/min</b> <b>Final Draw Down: 0 ft</b>	<b>Instrument Used: Aqua TROLL 600 Vented</b> <b>Serial Number: 469050</b>
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## Test Notes:

Sample time 0945

## Weather Conditions:

Overcast, cool

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15 %		
3/21/2018 10:18 AM	00:00	10.77 pH	48.72 °F	0.38 µS/cm	11.34 mg/L	0.00 NTU	126.7 mV	4.97 ft	150.00 ml/min
3/21/2018 10:21 AM	03:00	8.42 pH	48.54 °F	0.38 µS/cm	11.36 mg/L	0.00 NTU	96.3 mV	4.97 ft	150.00 ml/min
3/21/2018 10:24 AM	06:00	8.94 pH	48.45 °F	0.38 µS/cm	11.37 mg/L	0.00 NTU	86.4 mV	4.97 ft	150.00 ml/min
3/21/2018 10:27 AM	09:00	9.68 pH	48.39 °F	0.38 µS/cm	11.38 mg/L	0.00 NTU	119.1 mV	4.97 ft	150.00 ml/min
3/21/2018 10:30 AM	12:00	8.32 pH	48.34 °F	0.38 µS/cm	11.38 mg/L	0.00 NTU	73.1 mV	4.97 ft	150.00 ml/min
3/21/2018 10:33 AM	15:00	9.08 pH	48.37 °F	0.40 µS/cm	11.38 mg/L	0.00 NTU	127.0 mV	4.97 ft	150.00 ml/min
3/21/2018 10:36 AM	18:00	10.13 pH	48.41 °F	0.40 µS/cm	11.37 mg/L	0.00 NTU	124.7 mV	4.97 ft	150.00 ml/min
3/21/2018 10:39 AM	21:00	10.15 pH	48.48 °F	0.41 µS/cm	11.35 mg/L	0.00 NTU	117.1 mV	4.97 ft	150.00 ml/min
3/21/2018 10:42 AM	24:00	10.18 pH	48.52 °F	0.40 µS/cm	11.32 mg/L	0.00 NTU	119.9 mV	4.97 ft	150.00 ml/min

## Samples

Sample ID:	Description:
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# Low-Flow Test Report:

Test Date / Time: 3/21/2018 11:35:47 AM

Project: Edmonds Terminal 1Q18

Operator Name: Patrick Collins

<b>Location Name: MW-516</b> <b>Well Diameter: 2 in</b> <b>Casing Type: PVC</b> <b>Screen Length: 10 ft</b> <b>Top of Screen: 3 ft</b> <b>Total Depth: 13 ft</b> <b>Initial Depth to Water: 4.64 ft</b>	<b>Pump Type: Geotech geopump series 2</b> <b>Tubing Type: Polyethylene 0.170" x 1/4"</b> <b>Pump Intake From TOC: 8 ft</b> <b>Estimated Total Volume Pumped: 1350 ml</b> <b>Flow Cell Volume: 130 ml</b> <b>Final Flow Rate: 150 ml/min</b> <b>Final Draw Down: 0 ft</b>	<b>Instrument Used: Aqua TROLL 600 Vented</b> <b>Serial Number: 469050</b>
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## Test Notes:

## Weather Conditions:

Overcast, cool

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15 %		
3/21/2018 11:35 AM	00:00	11.31 pH	50.36 °F	0.39 µS/cm	11.08 mg/L	0.00 NTU	116.6 mV	4.64 ft	150.00 ml/min
3/21/2018 11:38 AM	03:00	9.48 pH	49.24 °F	0.40 µS/cm	11.25 mg/L	0.00 NTU	116.5 mV	4.64 ft	150.00 ml/min
3/21/2018 11:41 AM	06:00	9.81 pH	48.88 °F	0.40 µS/cm	11.30 mg/L	0.00 NTU	122.6 mV	4.64 ft	150.00 ml/min
3/21/2018 11:44 AM	09:00	10.03 pH	48.64 °F	0.40 µS/cm	11.33 mg/L	0.00 NTU	120.7 mV	4.64 ft	150.00 ml/min

## Samples

Sample ID:	Description:
MW-516	Sample time 1100
MW-516-MS	Sample time 1100
MW-516-MSD	Sample time 1100

# Low-Flow Test Report:

Test Date / Time: 3/21/2018 12:49:22 PM

Project: Edmonds Terminal 1Q18

Operator Name: Patrick Collins

<b>Location Name: MW-517</b> <b>Well Diameter: 2 in</b> <b>Casing Type: PVC</b> <b>Screen Length: 10 m</b> <b>Top of Screen: 3 m</b> <b>Total Depth: 13 m</b> <b>Initial Depth to Water: 5.4 ft</b>	<b>Pump Type: Geotech geopump series 2</b> <b>Tubing Type: Polyethylene 0.170" x 1/4"</b> <b>Pump Intake From TOC: 9.5 ft</b> <b>Estimated Total Volume Pumped: 1800 ml</b> <b>Flow Cell Volume: 130 ml</b> <b>Final Flow Rate: 150 ml/min</b> <b>Final Draw Down: 0 ft</b>	<b>Instrument Used: Aqua TROLL 600 Vented</b> <b>Serial Number: 469050</b>
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## Test Notes:

## Weather Conditions:

Overcast, cool

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15 %		
3/21/2018 12:49 PM	00:00		48.82 °F	0.38 µS/cm	11.32 mg/L	0.00 NTU	108.3 mV	5.40 ft	150.00 ml/min
3/21/2018 12:52 PM	03:00	11.25 pH	48.32 °F	0.38 µS/cm	11.39 mg/L	0.00 NTU	117.4 mV	5.40 ft	150.00 ml/min
3/21/2018 12:55 PM	06:00	10.74 pH	48.10 °F	0.38 µS/cm	11.41 mg/L	0.00 NTU	109.8 mV	5.40 ft	150.00 ml/min
3/21/2018 12:58 PM	09:00	11.07 pH	47.93 °F	0.39 µS/cm	11.42 mg/L	0.00 NTU	118.7 mV	5.40 ft	150.00 ml/min
3/21/2018 1:01 PM	12:00	10.79 pH	47.83 °F	0.39 µS/cm	11.43 mg/L	0.00 NTU	113.0 mV	5.40 ft	150.00 ml/min

## Samples

Sample ID:	Description:
MW-517	Sample time 1210

# Low-Flow Test Report:

Test Date / Time: 3/21/2018 1:50:15 PM

Project: Edmonds Terminal 1Q18

Operator Name: Patrick Collins

<b>Location Name: MW-518</b> <b>Well Diameter: 2 in</b> <b>Casing Type: PVC</b> <b>Screen Length: 10 ft</b> <b>Top of Screen: 2.5 ft</b> <b>Total Depth: 12.5 ft</b> <b>Initial Depth to Water: 8.26 ft</b>	<b>Pump Type: Geotech geopump series 2</b> <b>Tubing Type: Polyethylene 0.170" x 1/4"</b> <b>Pump Intake From TOC: 8.5 ft</b> <b>Estimated Total Volume Pumped: 1350 ml</b> <b>Flow Cell Volume: 130 ml</b> <b>Final Flow Rate: 150 ml/min</b> <b>Final Draw Down: 0.1 ft</b>	<b>Instrument Used: Aqua TROLL 600 Vented</b> <b>Serial Number: 469050</b>
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## Test Notes:

## Weather Conditions:

Overcast, cool

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15 %		
3/21/2018 1:50 PM	00:00	8.89 pH	50.94 °F	0.37 µS/cm	10.91 mg/L	69.94 NTU	115.6 mV	8.26 ft	150.00 ml/min
3/21/2018 1:53 PM	03:00	9.43 pH	50.71 °F	0.37 µS/cm	10.93 mg/L	69.82 NTU	114.4 mV	8.26 ft	150.00 ml/min
3/21/2018 1:56 PM	06:00	9.47 pH	50.59 °F	0.37 µS/cm	10.95 mg/L	69.71 NTU	114.2 mV	8.26 ft	150.00 ml/min
3/21/2018 1:59 PM	09:00	9.96 pH	50.50 °F	0.37 µS/cm	10.96 mg/L	69.39 NTU	113.3 mV	8.26 ft	150.00 ml/min

## Samples

Sample ID:	Description:
MW-518	Sample time 1305

# Low-Flow Test Report:

Test Date / Time: 3/22/2018 10:21:36 AM

Project: Edmonds Terminal 1Q18

Operator Name: RB

<b>Location Name: MW-519</b> <b>Latitude: 47.8056099312164</b> <b>Longitude: -122.390675581992</b> <b>Well Diameter: 2 in</b> <b>Casing Type: PVC</b> <b>Screen Length: 10 ft</b> <b>Top of Screen: 3 ft</b> <b>Total Depth: 13 ft</b> <b>Initial Depth to Water: 6.64 ft</b>	<b>Pump Type: Geotech geopump Series 2</b> <b>Tubing Type: Polyethylene 0.17" x 0.25"</b> <b>Pump Intake From TOC: 10 ft</b> <b>Estimated Total Volume Pumped: 3600 ml</b> <b>Flow Cell Volume: 130 ml</b> <b>Final Flow Rate: 200 ml/min</b> <b>Final Draw Down: 0 ft</b>	<b>Instrument Used: Aqua TROLL 600 Vented</b> <b>Serial Number: 469079</b>
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## Test Notes:

Sample Time: 1040

Final DTW: 6.64' btoc

Final RDO: 3.57 mg/L

## Weather Conditions:

Heavy rain, 45F

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15 %		
3/22/2018 10:21 AM	00:00	6.97 pH	8.90 °C	258.82 µS/cm	0.67 mg/L	6.62 NTU	67.5 mV	6.64 ft	200.00 ml/min
3/22/2018 10:24 AM	03:00	7.07 pH	8.88 °C	332.89 µS/cm	2.38 mg/L	1.20 NTU	82.0 mV	6.64 ft	200.00 ml/min
3/22/2018 10:27 AM	06:00	7.12 pH	8.79 °C	350.56 µS/cm	3.25 mg/L	1.63 NTU	87.9 mV	6.64 ft	200.00 ml/min
3/22/2018 10:30 AM	09:00	7.17 pH	8.74 °C	371.69 µS/cm	3.71 mg/L	0.60 NTU	93.9 mV	6.64 ft	200.00 ml/min
3/22/2018 10:33 AM	12:00	7.15 pH	8.71 °C	379.97 µS/cm	3.76 mg/L	0.64 NTU	97.3 mV	6.64 ft	200.00 ml/min
3/22/2018 10:36 AM	15:00	7.19 pH	8.72 °C	372.40 µS/cm	3.76 mg/L	0.02 NTU	97.9 mV	6.64 ft	200.00 ml/min
3/22/2018 10:39 AM	18:00	7.19 pH	8.70 °C	370.84 µS/cm	3.57 mg/L	0.00 NTU	102.3 mV	6.64 ft	200.00 ml/min

## Samples

Sample ID:	Description:
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MW-519	1040
DUP-4	--

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# Low-Flow Test Report:

Test Date / Time: 3/20/2018 10:21:09 AM

Project: Edmonds Terminal 1q18

Operator Name: JI

<b>Location Name: MW-520</b> <b>Well Diameter: 2 in</b> <b>Casing Type: Pvc</b> <b>Screen Length: 10 ft</b> <b>Top of Screen: 3 ft</b> <b>Total Depth: 13 ft</b> <b>Initial Depth to Water: 7.44 ft</b>	<b>Pump Type: Geotech geopump series 2</b> <b>Tubing Type: Polyethylene 0.170" x 1/4"</b> <b>Pump Intake From TOC: 10 m</b> <b>Estimated Total Volume Pumped: 1350 ml</b> <b>Flow Cell Volume: 130 ml</b> <b>Final Flow Rate: 150 ml/min</b> <b>Final Draw Down: 0 ft</b>	<b>Instrument Used: Aqua TROLL 600 Vented</b> <b>Serial Number: 469050</b>
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## Test Notes:

## Weather Conditions:

Over cast

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15 %		
3/20/2018 10:21 AM	00:00	7.21 pH	48.42 °F	851.39 µS/cm	5.12 mg/L	0.00 NTU	111.2 mV	7.44 ft	150.00 ml/min
3/20/2018 10:24 AM	03:00	7.20 pH	48.43 °F	822.28 µS/cm	4.71 mg/L	0.00 NTU	108.7 mV	7.44 ft	150.00 ml/min
3/20/2018 10:27 AM	06:00	7.18 pH	48.41 °F	802.58 µS/cm	4.44 mg/L	0.00 NTU	107.4 mV	7.44 ft	150.00 ml/min
3/20/2018 10:30 AM	09:00	7.18 pH	48.45 °F	783.61 µS/cm	4.30 mg/L	0.00 NTU	106.2 mV	7.44 ft	150.00 ml/min

## Samples

Sample ID:	Description:
Mw-520	Sample time: 0930 Final dtw: 7.44 Final rdo: 4.44

# Low-Flow Test Report:

**Test Date / Time:** 3/20/2018 10:00:41 AM

**Project:** Edmonds Terminal 1Q18

**Operator Name:** EK

<p><b>Location Name: MW-521</b>  <b>Well Diameter: 2 in</b>  <b>Casing Type: PVC</b>  <b>Screen Length: 10 ft</b>  <b>Top of Screen: 3 ft</b>  <b>Total Depth: 13 ft</b>  <b>Initial Depth to Water: 6.35 ft</b></p>	<p><b>Pump Type: Geotech geopump series 2</b>  <b>Tubing Type: Polyethylene 0.170 x 1/4"</b>  <b>Pump Intake From TOC: 9 ft</b>  <b>Estimated Total Volume Pumped: 6750 ml</b>  <b>Flow Cell Volume: 130 ml</b>  <b>Final Flow Rate: 150 ml/min</b>  <b>Final Draw Down: 0 ft</b></p>	<p><b>Instrument Used: Aqua TROLL 600 Vented</b>  <b>Serial Number: 457166</b></p>
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## Test Notes:

## Weather Conditions:

Cloudy 40

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15 %		
3/20/2018 10:00 AM	00:00	6.98 pH	49.23 °F	309.30 µS/cm	0.54 mg/L	279.07 NTU	278.9 mV	6.35 ft	150.00 ml/min
3/20/2018 10:03 AM	03:00	7.00 pH	49.23 °F	318.27 µS/cm	0.94 mg/L	8,875.8 NTU	256.4 mV	6.35 ft	150.00 ml/min
3/20/2018 10:06 AM	06:00	6.98 pH	49.27 °F	318.72 µS/cm	0.91 mg/L	3,821.3 NTU	245.9 mV	6.35 ft	150.00 ml/min
3/20/2018 10:09 AM	09:00	6.99 pH	49.30 °F	318.00 µS/cm	0.52 mg/L	7,126.9 NTU	238.4 mV	6.35 ft	150.00 ml/min
3/20/2018 10:12 AM	12:00	6.99 pH	49.24 °F	319.22 µS/cm	0.60 mg/L	5,678.8 NTU	231.5 mV	6.35 ft	150.00 ml/min
3/20/2018 10:15 AM	15:00	6.99 pH	49.23 °F	319.21 µS/cm	0.60 mg/L	41.67 NTU	225.8 mV	6.35 ft	150.00 ml/min
3/20/2018 10:18 AM	18:00	6.99 pH	49.23 °F	317.92 µS/cm	0.88 mg/L	252.58 NTU	218.0 mV	6.35 ft	150.00 ml/min
3/20/2018 10:21 AM	21:00	6.99 pH	49.26 °F	315.08 µS/cm	0.66 mg/L	5,074.0 NTU	210.7 mV	6.35 ft	150.00 ml/min
3/20/2018 10:24 AM	24:00	6.99 pH	49.25 °F	316.45 µS/cm	0.78 mg/L	5,355.2 NTU	206.6 mV	6.35 ft	150.00 ml/min
3/20/2018 10:27 AM	27:00	6.99 pH	49.25 °F	319.07 µS/cm	1.31 mg/L	5,998.0 NTU	202.6 mV	6.35 ft	150.00 ml/min
3/20/2018 10:30 AM	30:00	6.99 pH	49.31 °F	321.97 µS/cm	0.70 mg/L	10,354 NTU	200.0 mV	6.35 ft	150.00 ml/min
3/20/2018 10:33 AM	33:00	6.99 pH	49.32 °F	325.24 µS/cm	0.75 mg/L	3,734.6 NTU	195.8 mV	6.35 ft	150.00 ml/min

3/20/2018 10:36 AM	36:00	6.99 pH	49.35 °F	322.81 µS/cm	1.13 mg/L	8,360.5 NTU	193.1 mV	6.35 ft	150.00 ml/min
3/20/2018 10:39 AM	39:00	7.00 pH	49.37 °F	320.88 µS/cm	1.13 mg/L	89.24 NTU	191.4 mV	6.35 ft	150.00 ml/min
3/20/2018 10:42 AM	42:00	7.00 pH	49.40 °F	314.28 µS/cm	1.82 mg/L	3,956.7 NTU	188.9 mV	6.35 ft	150.00 ml/min
3/20/2018 10:45 AM	45:00	6.99 pH	49.39 °F	320.66 µS/cm	1.30 mg/L	11,655 NTU	189.0 mV	6.35 ft	150.00 ml/min

## Samples

Sample ID:	Description:
MW-521	<p>Sample time:0950</p> <p>Final DTW: 6.35 ft btoc</p> <p>Final RDO: 1.30 mg/L didn't stabilize</p>

# Low-Flow Test Report:

**Test Date / Time:** 3/20/2018 11:33:50 AM

**Project:** Edmonds Terminal 1Q18 (2)

**Operator Name:** EK

<p><b>Location Name:</b> MW-522  <b>Well Diameter:</b> 2 in  <b>Casing Type:</b> PVC  <b>Screen Length:</b> 10 ft  <b>Top of Screen:</b> 3 ft  <b>Total Depth:</b> 13 ft  <b>Initial Depth to Water:</b> 7.96 ft</p>	<p><b>Pump Type:</b> Geotech geopump series 2  <b>Tubing Type:</b> Polyethylene 0.170 x 1/4"  <b>Pump Intake From TOC:</b> 9 ft  <b>Estimated Total Volume Pumped:</b> 2700 ml  <b>Flow Cell Volume:</b> 130 ml  <b>Final Flow Rate:</b> 150 ml/min  <b>Final Draw Down:</b> 0.9 ft</p>	<p><b>Instrument Used:</b> Aqua TROLL 600 Vented  <b>Serial Number:</b> 457166</p>
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**Test Notes:**

**Weather Conditions:**

Cloudy and 45

**Low-Flow Readings:**

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15 %		
3/20/2018 11:33 AM	00:00	7.13 pH	50.13 °F	566.05 µS/cm	0.71 mg/L	10.31 NTU	263.9 mV	7.96 ft	150.00 ml/min
3/20/2018 11:36 AM	03:00	7.15 pH	50.17 °F	567.49 µS/cm	0.92 mg/L	5.96 NTU	246.4 mV	7.96 ft	150.00 ml/min
3/20/2018 11:39 AM	06:00	7.16 pH	50.28 °F	563.96 µS/cm	1.24 mg/L	7.58 NTU	238.8 mV	7.96 ft	150.00 ml/min
3/20/2018 11:42 AM	09:00	7.15 pH	49.89 °F	568.06 µS/cm	0.76 mg/L	3.74 NTU	223.3 mV	7.96 ft	150.00 ml/min
3/20/2018 11:45 AM	12:00	7.15 pH	49.97 °F	567.60 µS/cm	0.63 mg/L	4.14 NTU	220.7 mV	7.96 ft	150.00 ml/min
3/20/2018 11:48 AM	15:00	7.15 pH	49.90 °F	567.99 µS/cm	0.68 mg/L	2.39 NTU	220.6 mV	7.96 ft	150.00 ml/min
3/20/2018 11:51 AM	18:00	7.15 pH	49.86 °F	567.69 µS/cm	0.72 mg/L	4.92 NTU	221.0 mV	7.96 ft	150.00 ml/min

**Samples**

Sample ID:	Description:
MW-522	Sample time 1055 Final dtw: 8.05 ft btoc Final RDO: 0.72 mg/L



# Low-Flow Test Report:

**Test Date / Time:** 3/20/2018 12:20:54 PM

**Project:** Edmonds Terminal 1Q18 (2)

**Operator Name:** Patrick Collins

<p><b>Location Name: MW-525</b>  <b>Well Diameter: 2 in</b>  <b>Casing Type: PVC</b>  <b>Screen Length: 10 ft</b>  <b>Top of Screen: 3 ft</b>  <b>Total Depth: 13 ft</b>  <b>Initial Depth to Water: 6.24 ft</b></p>	<p><b>Pump Type: Geotech geopump series 2</b>  <b>Tubing Type: Polyethylene 0.170" x 1/4"</b>  <b>Pump Intake From TOC: 12 ft</b>  <b>Estimated Total Volume Pumped: 6750 ml</b>  <b>Flow Cell Volume: 130 ml</b>  <b>Final Flow Rate: 150 ml/min</b>  <b>Final Draw Down: 0.21 ft</b></p>	<p><b>Instrument Used: Aqua TROLL 600 Vented</b>  <b>Serial Number: 468986</b></p>
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## Test Notes:

Sample time 1210.

pH and S Cond. sensors malfunctioned

## Weather Conditions:

Cloudy, cool

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15 %		
3/20/2018 12:20 PM	00:00		51.81 °F	0.00 µS/cm	10.42 mg/L	1.68 NTU	119.9 mV	6.24 ft	150.00 ml/min
3/20/2018 12:23 PM	03:00		51.15 °F	0.00 µS/cm	10.43 mg/L	1.65 NTU	62.9 mV	6.24 ft	150.00 ml/min
3/20/2018 12:26 PM	06:00		50.84 °F	0.00 µS/cm	10.47 mg/L	1.65 NTU	143.8 mV	6.24 ft	150.00 ml/min
3/20/2018 12:29 PM	09:00		50.63 °F	0.00 µS/cm	10.50 mg/L	1.80 NTU	69.7 mV	6.24 ft	150.00 ml/min
3/20/2018 12:32 PM	12:00		50.54 °F	0.00 µS/cm	10.48 mg/L	1.72 NTU	129.7 mV	6.24 ft	150.00 ml/min
3/20/2018 12:35 PM	15:00		50.52 °F	0.00 µS/cm	10.49 mg/L	1.80 NTU	93.8 mV	6.24 ft	150.00 ml/min
3/20/2018 12:38 PM	18:00		50.45 °F	0.00 µS/cm	10.51 mg/L	1.76 NTU	83.4 mV	6.24 ft	150.00 ml/min
3/20/2018 12:41 PM	21:00		50.35 °F	0.00 µS/cm	10.52 mg/L	1.82 NTU	87.6 mV	6.24 ft	150.00 ml/min
3/20/2018 12:44 PM	24:00		50.29 °F	0.00 µS/cm	10.54 mg/L	1.88 NTU	77.1 mV	6.24 ft	150.00 ml/min
3/20/2018 12:47 PM	27:00		50.26 °F	0.00 µS/cm	10.55 mg/L	1.80 NTU	80.3 mV	6.24 ft	150.00 ml/min
3/20/2018 12:50 PM	30:00		50.29 °F	0.00 µS/cm	10.56 mg/L	1.80 NTU	90.6 mV	6.24 ft	150.00 ml/min
3/20/2018 12:53 PM	33:00		50.28 °F	0.00 µS/cm	10.54 mg/L	1.88 NTU	80.9 mV	6.24 ft	150.00 ml/min

3/20/2018 12:56 PM	36:00		50.29 °F	0.00 µS/cm	10.57 mg/L	1.87 NTU	73.2 mV	6.24 ft	150.00 ml/min
3/20/2018 12:59 PM	39:00		50.31 °F	0.00 µS/cm	10.58 mg/L	2.17 NTU	75.3 mV	6.24 ft	150.00 ml/min
3/20/2018 1:02 PM	42:00		50.35 °F	0.00 µS/cm	10.56 mg/L	2.31 NTU	64.4 mV	6.24 ft	150.00 ml/min
3/20/2018 1:05 PM	45:00		50.36 °F	0.00 µS/cm	10.55 mg/L	2.23 NTU	61.0 mV	6.24 ft	150.00 ml/min

## Samples

Sample ID:	Description:
MW-525	Collected at 1210



# Low-Flow Test Report:

**Test Date / Time:** 3/20/2018 1:47:11 PM

**Project:** Edmonds Terminal 1Q18

**Operator Name:** Patrick Collins

<p><b>Location Name: MW-526</b>  <b>Well Diameter: 2 in</b>  <b>Casing Type: PVC</b>  <b>Screen Length: 10 ft</b>  <b>Top of Screen: 3 ft</b>  <b>Total Depth: 13 ft</b>  <b>Initial Depth to Water: 5.44 ft</b></p>	<p><b>Pump Type: Geotech geopump series 2</b>  <b>Tubing Type: Polyethylene 0.170" x 1/4"</b>  <b>Pump Intake From TOC: 9.5 ft</b>  <b>Estimated Total Volume Pumped: 7200 ml</b>  <b>Flow Cell Volume: 130 ml</b>  <b>Final Flow Rate: 150 ml/min</b>  <b>Final Draw Down: 0.36 ft</b></p>	<p><b>Instrument Used: Aqua TROLL 600 Vented</b>  <b>Serial Number: 468986</b></p>
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**Test Notes:**

Sample time 1340

pH and S. Cond sensors malfunctioned.

**Weather Conditions:**

Partly cloudy, cool

**Low-Flow Readings:**

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15 %		
3/20/2018 1:47 PM	00:00		57.62 °F	0.00 µS/cm	10.44 mg/L	1.39 NTU	23.9 mV	5.44 ft	150.00 ml/min
3/20/2018 1:50 PM	03:00		53.94 °F	0.00 µS/cm	11.01 mg/L	2.14 NTU	17.0 mV	5.44 ft	150.00 ml/min
3/20/2018 1:53 PM	06:00		53.05 °F	0.00 µS/cm	11.12 mg/L	2.38 NTU	-3.7 mV	5.44 ft	150.00 ml/min
3/20/2018 1:56 PM	09:00		52.40 °F	0.00 µS/cm	11.19 mg/L	1.81 NTU	-22.6 mV	5.44 ft	150.00 ml/min
3/20/2018 1:59 PM	12:00		52.07 °F	0.00 µS/cm	11.23 mg/L	1.66 NTU	-14.7 mV	5.44 ft	150.00 ml/min
3/20/2018 2:02 PM	15:00		51.83 °F	0.00 µS/cm	11.30 mg/L	1.58 NTU	-29.9 mV	5.44 ft	150.00 ml/min
3/20/2018 2:05 PM	18:00		51.65 °F	0.00 µS/cm	11.29 mg/L	1.56 NTU	-3.7 mV	5.44 ft	150.00 ml/min
3/20/2018 2:08 PM	21:00		51.36 °F	0.00 µS/cm	11.36 mg/L	1.55 NTU	-30.5 mV	5.44 ft	150.00 ml/min
3/20/2018 2:11 PM	24:00		51.36 °F	0.00 µS/cm	11.34 mg/L	1.62 NTU	4.3 mV	5.44 ft	150.00 ml/min
3/20/2018 2:14 PM	27:00		51.36 °F	0.00 µS/cm	11.34 mg/L	1.57 NTU	-9.9 mV	5.44 ft	150.00 ml/min
3/20/2018 2:17 PM	30:00		51.17 °F	0.00 µS/cm	11.36 mg/L	1.61 NTU	-7.5 mV	5.44 ft	150.00 ml/min
3/20/2018 2:20 PM	33:00		50.95 °F	0.00 µS/cm	11.44 mg/L	1.56 NTU	11.7 mV	5.44 ft	150.00 ml/min

3/20/2018 2:23 PM	36:00		50.75 °F	0.00 µS/cm	11.46 mg/L	1.56 NTU	-3.3 mV	5.44 ft	150.00 ml/min
3/20/2018 2:26 PM	39:00		50.53 °F	0.00 µS/cm	11.54 mg/L	1.58 NTU	3.3 mV	5.44 ft	150.00 ml/min
3/20/2018 2:29 PM	42:00		50.32 °F	0.00 µS/cm	11.51 mg/L	1.59 NTU	-15.8 mV	5.44 ft	150.00 ml/min
3/20/2018 2:32 PM	45:00	7.41 pH	50.43 °F	0.00 µS/cm	10.39 mg/L	1.78 NTU	-19.6 mV	5.44 ft	150.00 ml/min
3/20/2018 2:35 PM	48:00	12.11 pH	49.73 °F	0.00 µS/cm	10.50 mg/L	1.67 NTU	-102.7 mV	5.44 ft	150.00 ml/min

## Samples

Sample ID:	Description:
MW-526	Sample time 1340

# Low-Flow Test Report:

**Test Date / Time:** 3/20/2018 2:48:56 PM  
**Project:** Edmonds Terminal 1q18 (2) (2) (2)  
**Operator Name:** JI

<b>Location Name: MW-530</b> <b>Well Diameter: 1 in</b> <b>Casing Type: Pvc</b> <b>Screen Length: 5 ft</b> <b>Top of Screen: 3 ft</b> <b>Total Depth: 8 ft</b> <b>Initial Depth to Water: 5.1 ft</b>	<b>Pump Type: Geotech geopump series 2</b> <b>Tubing Type: Polyethylene 0.170" x 1/4"</b> <b>Pump Intake From TOC: 6.5 ft</b> <b>Estimated Total Volume Pumped: 4050 ml</b> <b>Flow Cell Volume: 130 ml</b> <b>Final Flow Rate: 150 ml/min</b> <b>Final Draw Down: 1.14 ft</b>	<b>Instrument Used: Aqua TROLL 600 Vented</b> <b>Serial Number: 469050</b>
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## Test Notes:

**Weather Conditions:**  
 Sunny

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15 %		
3/20/2018 2:48 PM	00:00	6.64 pH	49.15 °F	20,010 µS/cm	0.59 mg/L	62.59 NTU	-202.9 mV	5.10 ft	150.00 ml/min
3/20/2018 2:51 PM	03:00	6.64 pH	49.00 °F	20,692 µS/cm	0.33 mg/L	18.79 NTU	-210.8 mV	5.10 ft	150.00 ml/min
3/20/2018 2:54 PM	06:00	6.65 pH	48.79 °F	20,911 µS/cm	0.23 mg/L	20.09 NTU	-219.4 mV	5.10 ft	150.00 ml/min
3/20/2018 2:57 PM	09:00	6.66 pH	48.69 °F	20,971 µS/cm	0.19 mg/L	22.76 NTU	-226.2 mV	5.10 ft	150.00 ml/min
3/20/2018 3:00 PM	12:00	6.66 pH	48.59 °F	20,964 µS/cm	0.17 mg/L	6.90 NTU	-231.3 mV	5.10 ft	150.00 ml/min
3/20/2018 3:03 PM	15:00	6.68 pH	48.55 °F	21,003 µS/cm	0.17 mg/L	5.46 NTU	-236.1 mV	5.10 ft	150.00 ml/min
3/20/2018 3:06 PM	18:00	6.69 pH	48.50 °F	20,925 µS/cm	0.16 mg/L	1.26 NTU	-240.4 mV	5.10 ft	150.00 ml/min
3/20/2018 3:09 PM	21:00	6.70 pH	48.53 °F	20,850 µS/cm	0.15 mg/L	0.00 NTU	-244.3 mV	5.10 ft	150.00 ml/min
3/20/2018 3:12 PM	24:00	6.72 pH	48.54 °F	20,675 µS/cm	0.15 mg/L	0.00 NTU	-248.4 mV	5.10 ft	150.00 ml/min
3/20/2018 3:15 PM	27:00	6.73 pH	48.64 °F	20,529 µS/cm	0.14 mg/L	0.00 NTU	-252.0 mV	5.10 ft	150.00 ml/min

## Samples

Sample ID:	Description:
Mw-530	Sample time: 1418 Final rdo: 0.14 Final dtw: 6.24

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# Low-Flow Test Report:

Test Date / Time: 3/20/2018 12:07:47 PM

Project: Edmonds Terminal 1Q18 (2)

Operator Name: RB

<b>Location Name: MW-531</b> <b>Latitude: 47.8057173455703</b> <b>Longitude: -122.390449605882</b> <b>Well Diameter: 2 ft</b> <b>Casing Type: PVC</b> <b>Screen Length: 10 ft</b> <b>Top of Screen: 3 ft</b> <b>Total Depth: 13 ft</b> <b>Initial Depth to Water: 7.38 ft</b>	<b>Pump Type: peristaltic</b> <b>Tubing Type: 0.25" OD poly tubing</b> <b>Pump Intake From TOC: 10 ft</b> <b>Estimated Total Volume Pumped: 6300 ml</b> <b>Flow Cell Volume: 130 ml</b> <b>Final Flow Rate: 150 ml/min</b> <b>Final Draw Down: 0 ft</b>	<b>Instrument Used: Aqua TROLL 600 Vented</b> <b>Serial Number: 469079</b>
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## Test Notes:

Sample time:1250

## Weather Conditions:

Mostly cloudy

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 15 %		
3/20/2018 12:07 PM	00:00	8.68 pH	9.39 °C	363.60 µS/cm	0.17 mg/L	100.2 mV	7.38 ft	150.00 ml/min
3/20/2018 12:10 PM	03:00	11.82 pH	9.33 °C	362.86 µS/cm	0.21 mg/L	-116.4 mV	7.38 ft	150.00 ml/min
3/20/2018 12:13 PM	06:00	12.14 pH	9.13 °C	364.16 µS/cm	0.26 mg/L	-148.1 mV	7.38 ft	150.00 ml/min
3/20/2018 12:16 PM	09:00	12.48 pH	9.05 °C	364.33 µS/cm	0.34 mg/L	-175.6 mV	7.38 ft	150.00 ml/min
3/20/2018 12:19 PM	12:00	12.96 pH	8.98 °C	368.80 µS/cm	0.37 mg/L	-206.8 mV	7.38 ft	150.00 ml/min
3/20/2018 12:22 PM	15:00	13.33 pH	8.97 °C	366.40 µS/cm	0.43 mg/L	-227.6 mV	7.38 ft	150.00 ml/min
3/20/2018 12:25 PM	18:00	13.62 pH	8.95 °C	367.71 µS/cm	0.50 mg/L	-249.2 mV	7.38 ft	150.00 ml/min
3/20/2018 12:28 PM	21:00	7.09 pH	8.93 °C	368.34 µS/cm	0.53 mg/L	110.3 mV	7.38 ft	150.00 ml/min
3/20/2018 12:31 PM	24:00	7.07 pH	9.04 °C	369.07 µS/cm	0.58 mg/L	111.5 mV	7.38 ft	150.00 ml/min
3/20/2018 12:34 PM	27:00	7.06 pH	9.00 °C	369.17 µS/cm	0.61 mg/L	112.5 mV	7.38 ft	150.00 ml/min
3/20/2018 12:37 PM	30:00	7.05 pH	8.99 °C	369.40 µS/cm	0.53 mg/L	111.3 mV	7.38 ft	150.00 ml/min
3/20/2018 12:40 PM	33:00	7.03 pH	8.98 °C	370.05 µS/cm	0.50 mg/L	111.8 mV	7.38 ft	150.00 ml/min

3/20/2018 12:43 PM	36:00	7.04 pH	9.00 °C	370.54 µS/cm	0.57 mg/L	110.8 mV	7.38 ft	150.00 ml/min
3/20/2018 12:46 PM	39:00	7.04 pH	9.00 °C	370.45 µS/cm	0.55 mg/L	110.4 mV	7.38 ft	150.00 ml/min
3/20/2018 12:49 PM	42:00	7.04 pH	8.96 °C	371.15 µS/cm	0.55 mg/L	109.2 mV	7.38 ft	150.00 ml/min

## Samples

Sample ID:	Description:
MW-531	1250

# Low-Flow Test Report:

Test Date / Time: 3/20/2018 10:27:51 AM

Project: Edmonds Terminal 1Q18

Operator Name: RB

<b>Location Name: MW-532</b> <b>Latitude: 47.805876327414</b> <b>Longitude: -122.389119565487</b> <b>Well Diameter: 2 in</b> <b>Casing Type: PVC</b> <b>Screen Length: 10 ft</b> <b>Top of Screen: 3 ft</b> <b>Total Depth: 13 ft</b> <b>Initial Depth to Water: 6.98 ft</b>	<b>Pump Type: peristaltic</b> <b>Tubing Type: 0.25" OD poly tubing</b> <b>Pump Intake From TOC: 10 ft</b> <b>Estimated Total Volume Pumped: 6875 ml</b> <b>Flow Cell Volume: 130 ml</b> <b>Final Flow Rate: 150 ml/min</b> <b>Final Draw Down: 0 ft</b>	<b>Instrument Used: Aqua TROLL 600 Vented</b> <b>Serial Number: 469079</b>
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## Test Notes:

Sample time: 1115

Null pH readings - pumped for the full 45 minutes.

## Weather Conditions:

Overcast, cool

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15	+/- 10 %	+/- 15 %		
3/20/2018 10:27 AM	00:00		9.71 °C	277.19 µS/cm	4.27 mg/L	1.68 NTU		6.98 ft	150.00 ml/min
3/20/2018 10:30 AM	03:00		9.12 °C	272.32 µS/cm	0.95 mg/L	0.82 NTU		6.98 ft	150.00 ml/min
3/20/2018 10:33 AM	06:00		8.93 °C	274.18 µS/cm	1.31 mg/L	1.58 NTU		6.98 ft	150.00 ml/min
3/20/2018 10:36 AM	09:00		8.93 °C	273.95 µS/cm	1.16 mg/L	1.17 NTU		6.98 ft	150.00 ml/min
3/20/2018 10:39 AM	12:00		8.98 °C	274.54 µS/cm	0.87 mg/L	3.25 NTU		6.98 ft	150.00 ml/min
3/20/2018 10:42 AM	15:00		9.06 °C	278.76 µS/cm	0.71 mg/L	0.40 NTU		6.98 ft	150.00 ml/min
3/20/2018 10:45 AM	18:00		9.07 °C	280.72 µS/cm	0.65 mg/L	0.49 NTU		6.98 ft	150.00 ml/min
3/20/2018 10:48 AM	21:00		9.11 °C	277.99 µS/cm	0.58 mg/L	0.66 NTU		6.98 ft	150.00 ml/min
3/20/2018 10:51 AM	24:00		9.14 °C	281.61 µS/cm	0.59 mg/L	2.26 NTU		6.98 ft	150.00 ml/min
3/20/2018 11:01 AM	33:50		9.15 °C	278.94 µS/cm	0.39 mg/L	0.18 NTU		6.98 ft	150.00 ml/min
3/20/2018 11:04 AM	36:50		9.18 °C	278.09 µS/cm	0.40 mg/L	0.00 NTU		6.98 ft	150.00 ml/min
3/20/2018 11:07 AM	39:50		9.24 °C	280.14 µS/cm	0.44 mg/L	1.74 NTU		6.98 ft	150.00 ml/min

3/20/2018 11:10 AM	42:50		9.31 °C	287.41 µS/cm	0.30 mg/L	0.00 NTU		6.98 ft	150.00 ml/min
3/20/2018 11:13 AM	45:50		9.28 °C	288.13 µS/cm	0.27 mg/L	0.00 NTU		6.98 ft	150.00 ml/min

## Samples

Sample ID:	Description:
MW-532	1115
MW-532-MS	1115
MW-532-MSD	1115



# Low-Flow Test Report:

Test Date / Time: 3/20/2018 12:36:02 PM

Project: Edmonds Terminal 1q18 (2) (2)

Operator Name: JI

<b>Location Name: MW-533</b> <b>Well Diameter: 2 in</b> <b>Casing Type: Pvc</b> <b>Screen Length: 10 ft</b> <b>Top of Screen: 3 ft</b> <b>Total Depth: 13 ft</b> <b>Initial Depth to Water: 5.31 ft</b>	<b>Pump Type: Geotech geopump series 2</b> <b>Tubing Type: Polyethylene 0.170" x 1/4"</b> <b>Pump Intake From TOC: 9 ft</b> <b>Estimated Total Volume Pumped: 1350 ml</b> <b>Flow Cell Volume: 130 ml</b> <b>Final Flow Rate: 150 ml/min</b> <b>Final Draw Down: 0.03 ft</b>	<b>Instrument Used: Aqua TROLL 600 Vented</b> <b>Serial Number: 469050</b>
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## Test Notes:

## Weather Conditions:

Overcast 40 degrees f

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15 %		
3/20/2018 12:36 PM	00:00	6.81 pH	48.98 °F	11,076 µS/cm	4.67 mg/L	0.00 NTU	152.6 mV	5.31 ft	150.00 ml/min
3/20/2018 12:39 PM	03:00	6.82 pH	48.33 °F	11,240 µS/cm	3.30 mg/L	0.00 NTU	170.3 mV	5.31 ft	150.00 ml/min
3/20/2018 12:42 PM	06:00	6.83 pH	48.10 °F	11,256 µS/cm	3.22 mg/L	0.00 NTU	161.5 mV	5.31 ft	150.00 ml/min
3/20/2018 12:45 PM	09:00	6.83 pH	47.90 °F	11,287 µS/cm	3.19 mg/L	0.00 NTU	155.7 mV	5.31 ft	150.00 ml/min

## Samples

Sample ID:	Description:
MW-533	Sample time: 1148 Final dtw: 5.34 Final rdo:

# Low-Flow Test Report:

**Test Date / Time:** 3/20/2018 4:11:31 PM

**Project:** Edmonds Terminal 1Q18 (2) (2) (2) (2)

**Operator Name:** EK

<p><b>Location Name: MW-534</b>  <b>Well Diameter: 2 in</b>  <b>Casing Type: PVC</b>  <b>Screen Length: 10 ft</b>  <b>Top of Screen: 3 ft</b>  <b>Total Depth: 13 ft</b>  <b>Initial Depth to Water: 3.75 ft</b></p>	<p><b>Pump Type: Geotech geopump series 2</b>  <b>Tubing Type: Polyethylene 0.170 x 1/4"</b>  <b>Pump Intake From TOC: 6 ft</b>  <b>Estimated Total Volume Pumped: 5850 ml</b>  <b>Flow Cell Volume: 130 ml</b>  <b>Final Flow Rate: 150 ml/min</b>  <b>Final Draw Down: 0.15 ft</b></p>	<p><b>Instrument Used: Aqua TROLL 600 Vented</b>  <b>Serial Number: 457166</b></p>
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**Test Notes:**

**Weather Conditions:**

Sunny and 50

**Low-Flow Readings:**

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15 %		
3/20/2018 4:11 PM	00:00	6.75 pH	54.53 °F	2,653.1 µS/cm	1.52 mg/L	100.64 NTU	19.2 mV	3.75 ft	150.00 ml/min
3/20/2018 4:14 PM	03:00	6.78 pH	52.22 °F	2,857.7 µS/cm	0.23 mg/L	107.14 NTU	4.8 mV	3.75 ft	150.00 ml/min
3/20/2018 4:17 PM	06:00	6.78 pH	51.66 °F	2,927.7 µS/cm	0.09 mg/L	113.28 NTU	-2.2 mV	3.75 ft	150.00 ml/min
3/20/2018 4:20 PM	09:00	6.77 pH	51.51 °F	3,000.5 µS/cm	0.10 mg/L	92.48 NTU	-6.5 mV	3.75 ft	150.00 ml/min
3/20/2018 4:23 PM	12:00	6.77 pH	51.43 °F	3,016.0 µS/cm	0.08 mg/L	90.08 NTU	-9.2 mV	3.75 ft	150.00 ml/min
3/20/2018 4:26 PM	15:00	6.77 pH	51.66 °F	3,094.0 µS/cm	0.18 mg/L	66.45 NTU	-10.9 mV	3.75 ft	150.00 ml/min
3/20/2018 4:29 PM	18:00	6.76 pH	51.86 °F	3,204.7 µS/cm	0.11 mg/L	53.35 NTU	-12.4 mV	3.75 ft	150.00 ml/min
3/20/2018 4:32 PM	21:00	6.76 pH	52.03 °F	3,305.9 µS/cm	0.09 mg/L	42.12 NTU	-14.0 mV	3.75 ft	150.00 ml/min
3/20/2018 4:35 PM	24:00	6.75 pH	51.92 °F	3,458.6 µS/cm	0.07 mg/L	37.91 NTU	-15.2 mV	3.75 ft	150.00 ml/min
3/20/2018 4:38 PM	27:00	6.75 pH	52.09 °F	3,573.3 µS/cm	0.12 mg/L	34.26 NTU	-16.3 mV	3.75 ft	150.00 ml/min
3/20/2018 4:41 PM	30:00	6.75 pH	52.14 °F	3,653.2 µS/cm	0.10 mg/L	25.70 NTU	-17.4 mV	3.75 ft	150.00 ml/min
3/20/2018 4:44 PM	33:00	6.75 pH	52.21 °F	3,742.4 µS/cm	0.07 mg/L	25.82 NTU	-18.3 mV	3.75 ft	150.00 ml/min

3/20/2018 4:47 PM	36:00	6.75 pH	52.20 °F	3,828.8 μS/cm	0.07 mg/L	21.20 NTU	-19.2 mV	3.75 ft	150.00 ml/min
3/20/2018 4:50 PM	39:00	6.74 pH	52.29 °F	3,908.1 μS/cm	0.08 mg/L	18.71 NTU	-20.0 mV	3.75 ft	150.00 ml/min

## Samples

Sample ID:	Description:
MW-534	Sample time : 1555 Final DTW: 3.90 ft btoc Final RDO: 0.07 mg/L

# Low-Flow Test Report:

Test Date / Time: 3/20/2018 12:31:23 PM

Project: Edmonds Terminal 1Q18 (2) (2)

Operator Name: EK

<b>Location Name: MW-535</b> <b>Well Diameter: 2 in</b> <b>Casing Type: PVC</b> <b>Screen Length: 10 ft</b> <b>Top of Screen: 3 ft</b> <b>Total Depth: 13 ft</b> <b>Initial Depth to Water: 5.16 ft</b>	<b>Pump Type: Geotech geopump series 2</b> <b>Tubing Type: Polyethylene 0.170 x 1/4"</b> <b>Pump Intake From TOC: 9 ft</b> <b>Estimated Total Volume Pumped: 900 ml</b> <b>Flow Cell Volume: 130 ml</b> <b>Final Flow Rate: 150 ml/min</b> <b>Final Draw Down: 0.4 ft</b>	<b>Instrument Used: Aqua TROLL 600 Vented</b> <b>Serial Number: 457166</b>
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## Test Notes:

## Weather Conditions:

Cloudy and 50

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15 %		
3/20/2018 12:31 PM	00:00	6.91 pH	48.60 °F	34,557 µS/cm	5.08 mg/L	11.76 NTU	303.7 mV	5.16 ft	150.00 ml/min
3/20/2018 12:34 PM	03:00	6.95 pH	48.31 °F	34,335 µS/cm	5.34 mg/L	20.96 NTU	302.4 mV	5.16 ft	150.00 ml/min
3/20/2018 12:37 PM	06:00	6.96 pH	48.11 °F	34,199 µS/cm	5.34 mg/L	8.97 NTU	299.1 mV	5.16 ft	150.00 ml/min

## Samples

Sample ID:	Description:
MW-535	Sample time 1145 Final DTW: 5.20 ft btoc Final RDO: 5.34 mg/L
DUP-1	

# Low-Flow Test Report:

Test Date / Time: 3/20/2018 1:19:02 PM

Project: Edmonds Terminal 1Q18 (2) (2)

Operator Name: RB

<b>Location Name: MW-E-R</b> <b>Latitude: 47.805971581175</b> <b>Longitude: -122.388081550598</b> <b>Well Diameter: 2 in</b> <b>Casing Type: PVC</b> <b>Screen Length: 10 ft</b> <b>Top of Screen: 3 ft</b> <b>Total Depth: 13 ft</b> <b>Initial Depth to Water: 6.92 ft</b>	<b>Pump Type: peristaltic</b> <b>Tubing Type: 0.25" OD poly tubing</b> <b>Pump Intake From TOC: 10 ft</b> <b>Estimated Total Volume Pumped: 6750 ml</b> <b>Flow Cell Volume: 130 ml</b> <b>Final Flow Rate: 150 ml/min</b> <b>Final Draw Down: 0.78 ft</b>	<b>Instrument Used: Aqua TROLL 600 Vented</b> <b>Serial Number: 469079</b>
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## Test Notes:

Sample time: 1405

DO/ORP did not stabilize after 45 minutes.

## Weather Conditions:

Sunny

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 15 %		
3/20/2018 1:19 PM	00:00	6.41 pH	10.99 °C	1,476.7 µS/cm	0.17 mg/L	-44.5 mV	6.92 ft	150.00 ml/min
3/20/2018 1:22 PM	03:00	6.45 pH	10.92 °C	1,477.6 µS/cm	0.11 mg/L	-57.6 mV	6.92 ft	150.00 ml/min
3/20/2018 1:25 PM	06:00	6.49 pH	10.86 °C	1,479.0 µS/cm	0.09 mg/L	-67.9 mV	6.92 ft	150.00 ml/min
3/20/2018 1:28 PM	09:00	6.51 pH	10.80 °C	1,475.8 µS/cm	0.07 mg/L	-73.4 mV	6.92 ft	150.00 ml/min
3/20/2018 1:31 PM	12:00	6.53 pH	10.76 °C	1,467.4 µS/cm	0.08 mg/L	-77.3 mV	6.92 ft	150.00 ml/min
3/20/2018 1:34 PM	15:00	6.53 pH	10.75 °C	1,467.1 µS/cm	0.06 mg/L	-79.0 mV	6.92 ft	150.00 ml/min
3/20/2018 1:37 PM	18:00	6.54 pH	10.70 °C	1,466.8 µS/cm	0.05 mg/L	-81.6 mV	6.92 ft	150.00 ml/min
3/20/2018 1:40 PM	21:00	6.56 pH	10.73 °C	1,469.7 µS/cm	0.04 mg/L	-83.7 mV	6.92 ft	150.00 ml/min
3/20/2018 1:43 PM	24:00	6.56 pH	10.77 °C	1,471.5 µS/cm	0.04 mg/L	-85.0 mV	6.92 ft	150.00 ml/min
3/20/2018 1:46 PM	27:00	6.57 pH	10.83 °C	1,473.3 µS/cm	0.03 mg/L	-87.8 mV	6.92 ft	150.00 ml/min
3/20/2018 1:49 PM	30:00	6.58 pH	10.82 °C	1,478.3 µS/cm	0.04 mg/L	-89.0 mV	6.92 ft	150.00 ml/min
3/20/2018 1:52 PM	33:00	6.59 pH	10.81 °C	1,482.4 µS/cm	0.03 mg/L	-88.9 mV	6.92 ft	150.00 ml/min

3/20/2018 1:55 PM	36:00	6.59 pH	10.82 °C	1,484.9 µS/cm	0.04 mg/L	-92.0 mV	6.92 ft	150.00 ml/min
3/20/2018 1:58 PM	39:00	6.59 pH	10.78 °C	1,492.4 µS/cm	0.02 mg/L	-93.0 mV	6.92 ft	150.00 ml/min
3/20/2018 2:01 PM	42:00	6.60 pH	10.81 °C	1,502.4 µS/cm	0.01 mg/L	-96.5 mV	6.92 ft	150.00 ml/min
3/20/2018 2:04 PM	45:00	6.60 pH	10.82 °C	1,506.6 µS/cm	0.01 mg/L	-99.6 mV	6.92 ft	150.00 ml/min

## Samples

Sample ID:	Description:
MW-E-R	1405

# Low-Flow Test Report:

Test Date / Time: 6/27/2018 12:22:06 PM

Project: Edmonds Terminal 2Q18

Operator Name: EK

<p><b>Location Name: LM-2</b>  <b>Well Diameter: 2 in</b>  <b>Casing Type: PVC</b>  <b>Screen Length: 5.5 ft</b>  <b>Top of Screen: 2.5 ft</b>  <b>Total Depth: 8 ft</b>  <b>Initial Depth to Water: 2 ft</b></p>	<p><b>Pump Type: Geotech geopump series 2</b>  <b>Tubing Type: Polyethylene 0.170" x 1/4"</b>  <b>Pump Intake From TOC: 4.5 ft</b>  <b>Estimated Total Volume Pumped: 4800 ml</b>  <b>Flow Cell Volume: 130 ml</b>  <b>Final Flow Rate: 200 ml/min</b>  <b>Final Draw Down: 0.1 ft</b></p>	<p><b>Instrument Used: Aqua TROLL 600 Vented</b>  <b>Serial Number: 466586</b></p>
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**Test Notes:**

**Weather Conditions:**

Sunny and 70

**Low-Flow Readings:**

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15 %		
6/27/2018 12:22 PM	00:00	6.34 pH	62.26 °F	6,768.4 µS/cm	0.20 mg/L	18.76 NTU	-93.8 mV	2.00 ft	200.00 ml/min
6/27/2018 12:25 PM	03:00	6.34 pH	61.97 °F	6,770.1 µS/cm	0.15 mg/L	25.49 NTU	-114.0 mV	2.00 ft	200.00 ml/min
6/27/2018 12:28 PM	06:00	6.33 pH	61.74 °F	6,784.1 µS/cm	0.12 mg/L	31.60 NTU	-122.3 mV	2.00 ft	200.00 ml/min
6/27/2018 12:31 PM	09:00	6.30 pH	61.71 °F	6,764.8 µS/cm	0.14 mg/L	28.52 NTU	-114.0 mV	2.00 ft	200.00 ml/min
6/27/2018 12:34 PM	12:00	6.27 pH	61.71 °F	6,692.7 µS/cm	0.18 mg/L	24.84 NTU	-96.7 mV	2.00 ft	200.00 ml/min
6/27/2018 12:37 PM	15:00	6.25 pH	61.65 °F	6,545.4 µS/cm	0.23 mg/L	25.87 NTU	-85.2 mV	2.00 ft	200.00 ml/min
6/27/2018 12:40 PM	18:00	6.24 pH	61.64 °F	6,401.5 µS/cm	0.29 mg/L	22.29 NTU	-77.1 mV	2.00 ft	200.00 ml/min
6/27/2018 12:43 PM	21:00	6.24 pH	61.76 °F	6,328.1 µS/cm	0.32 mg/L	22.43 NTU	-75.9 mV	2.00 ft	200.00 ml/min
6/27/2018 12:46 PM	24:00	6.22 pH	61.84 °F	6,198.0 µS/cm	0.32 mg/L	19.91 NTU	-71.0 mV	2.00 ft	200.00 ml/min

**Samples**

Sample ID:	Description:
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LM-2	Sample time 1150 Final DTW 2.10 ft btoc Final RDO 0.31 mg/L Ferrous iron 5.5 mg/L
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# Low-Flow Test Report:

Test Date / Time: 6/29/2018 9:49:59 AM

Project: Edmonds Terminal

Operator Name: Jason Little

<b>Location Name: Mw-8R</b> <b>Well Diameter: 2 in</b> <b>Casing Type: Pvc</b> <b>Screen Length: 10 ft</b> <b>Top of Screen: 3 ft</b> <b>Total Depth: 13 ft</b> <b>Initial Depth to Water: 8.43 ft</b>	<b>Pump Type: Geotech pump series 2</b> <b>Tubing Type: Polyethylene 0.170"</b> <b>x 1/4</b> <b>Pump Intake From TOC: 10 ft</b> <b>Estimated Total Volume Pumped:</b> <b>6300 ml</b> <b>Flow Cell Volume: 130 ml</b> <b>Final Flow Rate: 150 ml/min</b> <b>Final Draw Down: 0.02 ft</b>	<b>Instrument Used: Aqua TROLL 600</b> <b>Vented</b> <b>Serial Number: 466472</b>
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## Test Notes:

## Weather Conditions:

66 overcast

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15		
6/29/2018 9:49 AM	00:00	6.83 pH	56.02 °F	397.91 µS/cm	0.39 mg/L	4.29 NTU	198.1 mV	8.43 ft	150.00 ml/min
6/29/2018 9:52 AM	03:00	6.80 pH	56.09 °F	431.78 µS/cm	0.19 mg/L	2.63 NTU	159.9 mV	8.43 ft	150.00 ml/min
6/29/2018 9:55 AM	06:00	6.82 pH	56.08 °F	431.50 µS/cm	0.14 mg/L	1.94 NTU	147.9 mV	8.43 ft	150.00 ml/min
6/29/2018 9:58 AM	09:00	6.80 pH	56.10 °F	432.25 µS/cm	0.11 mg/L	0.14 NTU	139.3 mV	8.43 ft	150.00 ml/min
6/29/2018 10:01 AM	12:00	6.81 pH	56.08 °F	432.14 µS/cm	0.13 mg/L	0.00 NTU	132.7 mV	8.43 ft	150.00 ml/min
6/29/2018 10:04 AM	15:00	6.81 pH	56.11 °F	432.50 µS/cm	0.13 mg/L	0.00 NTU	127.4 mV	8.43 ft	150.00 ml/min
6/29/2018 10:07 AM	18:00	6.81 pH	56.13 °F	432.05 µS/cm	0.16 mg/L	0.14 NTU	123.1 mV	8.43 ft	150.00 ml/min
6/29/2018 10:10 AM	21:00	6.81 pH	56.16 °F	432.61 µS/cm	0.21 mg/L	0.04 NTU	119.0 mV	8.43 ft	150.00 ml/min
6/29/2018 10:13 AM	24:00	6.81 pH	56.19 °F	432.40 µS/cm	0.25 mg/L	0.00 NTU	117.1 mV	8.43 ft	150.00 ml/min
6/29/2018 10:16 AM	27:00	6.81 pH	56.25 °F	431.40 µS/cm	0.30 mg/L	0.00 NTU	115.2 mV	8.43 ft	150.00 ml/min
6/29/2018 10:19 AM	30:00	6.82 pH	56.30 °F	431.82 µS/cm	0.33 mg/L	0.00 NTU	113.0 mV	8.43 ft	150.00 ml/min
6/29/2018 10:22 AM	33:00	6.81 pH	56.34 °F	431.70 µS/cm	0.37 mg/L	0.00 NTU	110.6 mV	8.43 ft	150.00 ml/min
6/29/2018 10:25 AM	36:00	6.82 pH	56.35 °F	431.95 µS/cm	0.42 mg/L	0.00 NTU	108.3 mV	8.43 ft	150.00 ml/min

6/29/2018 10:28 AM	39:00	6.81 pH	56.38 °F	431.62 µS/cm	0.44 mg/L	0.00 NTU	106.1 mV	8.43 ft	150.00 ml/min
6/29/2018 10:31 AM	42:00	6.81 pH	56.40 °F	431.53 µS/cm	0.48 mg/L	0.00 NTU	103.4 mV	8.43 ft	150.00 ml/min

## Samples

Sample ID:	Description:
Mw-8r	Sample time-0945 ldtw-8.43 Fdtw-8.45 Frdo-0.0 Ferrous iron-0.0

# Low-Flow Test Report:

Test Date / Time: 6/29/2018 9:55:38 AM

Project: Edmonds Terminal 2Q18

Operator Name: EK

<b>Location Name: MW-20R</b> <b>Well Diameter: 2 in</b> <b>Casing Type: PVC</b> <b>Screen Length: 10 ft</b> <b>Top of Screen: 4 ft</b> <b>Total Depth: 14.5 ft</b> <b>Initial Depth to Water: 6.7 ft</b>	<b>Pump Type: Geotech geopump series 2</b> <b>Tubing Type: Polyethylene 0.170" x 1/4"</b> <b>Pump Intake From TOC: 10 ft</b> <b>Estimated Total Volume Pumped: 3600 ml</b> <b>Flow Cell Volume: 130 ml</b> <b>Final Flow Rate: 200 ml/min</b> <b>Final Draw Down: 0.05 ft</b>	<b>Instrument Used: Aqua TROLL 600 Vented</b> <b>Serial Number: 466586</b>
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## Test Notes:

## Weather Conditions:

70 and sunny

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15 %		
6/29/2018 9:55 AM	00:00	7.18 pH	57.90 °F	9,871.2 µS/cm	0.65 mg/L	135.98 NTU	-49.0 mV	6.70 ft	200.00 ml/min
6/29/2018 9:58 AM	03:00	7.19 pH	57.07 °F	9,616.8 µS/cm	0.33 mg/L	61.05 NTU	-93.4 mV	6.70 ft	200.00 ml/min
6/29/2018 10:01 AM	06:00	7.18 pH	56.31 °F	9,724.0 µS/cm	0.24 mg/L	109.65 NTU	-116.0 mV	6.70 ft	200.00 ml/min
6/29/2018 10:04 AM	09:00	7.16 pH	56.03 °F	9,639.6 µS/cm	0.21 mg/L	29.68 NTU	-128.9 mV	6.70 ft	200.00 ml/min
6/29/2018 10:07 AM	12:00	7.13 pH	55.93 °F	9,600.7 µS/cm	0.19 mg/L	14.89 NTU	-137.6 mV	6.70 ft	200.00 ml/min
6/29/2018 10:10 AM	15:00	7.09 pH	55.92 °F	9,571.1 µS/cm	0.18 mg/L	9.57 NTU	-143.9 mV	6.70 ft	200.00 ml/min
6/29/2018 10:13 AM	18:00	7.05 pH	55.83 °F	9,558.1 µS/cm	0.17 mg/L	15.78 NTU	-149.2 mV	6.70 ft	200.00 ml/min

## Samples

Sample ID:	Description:
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MW-20R

Sample time 0920  
Final DTW 6.75 ft btoc  
Final RDO 0.17 mg/L  
Ferrous iron 2.0 mg/L

# Low-Flow Test Report:

Test Date / Time: 6/28/2018 12:19:15 PM

Project: Edmonds Terminal 2Q18

Operator Name: EK

<b>Location Name: MW-101</b> <b>Well Diameter: 2 in</b> <b>Casing Type: PVC</b> <b>Screen Length: 10 ft</b> <b>Top of Screen: 5 ft</b> <b>Total Depth: 15 ft</b> <b>Initial Depth to Water: 9.35 ft</b>	<b>Pump Type: Geotech geopump series 2</b> <b>Tubing Type: Polyethylene 0.170" x 1/4"</b> <b>Pump Intake From TOC: 12 ft</b> <b>Estimated Total Volume Pumped: 1800 ml</b> <b>Flow Cell Volume: 130 ml</b> <b>Final Flow Rate: 200 ml/min</b> <b>Final Draw Down: 0.25 ft</b>	<b>Instrument Used: Aqua TROLL 600 Vented</b> <b>Serial Number: 466586</b>
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## Test Notes:

## Weather Conditions:

70 and cloudy

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15 %		
6/28/2018 12:19 PM	00:00	7.00 pH	58.38 °F	450.51 µS/cm	0.68 mg/L	5.03 NTU	64.3 mV	9.35 ft	200.00 ml/min
6/28/2018 12:22 PM	03:00	6.82 pH	57.72 °F	449.31 µS/cm	0.35 mg/L	1.93 NTU	72.7 mV	9.35 ft	200.00 ml/min
6/28/2018 12:25 PM	06:00	6.81 pH	57.70 °F	449.01 µS/cm	0.33 mg/L	0.70 NTU	75.4 mV	9.35 ft	200.00 ml/min
6/28/2018 12:28 PM	09:00	6.81 pH	57.72 °F	440.33 µS/cm	0.34 mg/L	1.14 NTU	77.8 mV	9.35 ft	200.00 ml/min

## Samples

Sample ID:	Description:
MW-101	Sample time 1135 Final DTW 9.60 ft btoc Final RDO 0.34 mg/L Ferrous iron 0.0 mg/L

# Low-Flow Test Report:

**Test Date / Time:** 6/27/2018 11:25:36 AM

**Project:** Edmonds Terminal 2Q18

**Operator Name:** PRMC

<p><b>Location Name: MW-104</b>  <b>Well Diameter: 2 in</b>  <b>Casing Type: PVC</b>  <b>Screen Length: 14 ft</b>  <b>Top of Screen: 13.4 ft</b>  <b>Total Depth: 3.3 ft</b>  <b>Initial Depth to Water: 8.64 ft</b></p>	<p><b>Pump Type: Geotech Geopump Series 2</b>  <b>Tubing Type: Polyethylene 0.170" x .25"</b>  <b>Pump Intake From TOC: 9 ft</b>  <b>Estimated Total Volume Pumped: 3150 ml</b>  <b>Flow Cell Volume: 130 ml</b>  <b>Final Flow Rate: 150 ml/min</b>  <b>Final Draw Down: 0.45 ft</b></p>	<p><b>Instrument Used: Aqua TROLL 600 Vented</b>  <b>Serial Number: 466689</b></p>
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**Test Notes:**

**Weather Conditions:**

Overcast, warm

**Low-Flow Readings:**

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15 %		
6/27/2018 11:25 AM	00:00	6.05 pH	68.23 °F	408.72 µS/cm	2.72 mg/L	52.64 NTU	73.4 mV	8.64 ft	150.00 ml/min
6/27/2018 11:28 AM	03:00	6.44 pH	62.67 °F	418.53 µS/cm	0.35 mg/L	16.88 NTU	19.3 mV	8.64 ft	150.00 ml/min
6/27/2018 11:31 AM	06:00	6.41 pH	61.31 °F	472.60 µS/cm	0.36 mg/L	18.77 NTU	-18.9 mV	8.64 ft	150.00 ml/min
6/27/2018 11:34 AM	09:00	6.42 pH	60.55 °F	473.31 µS/cm	0.30 mg/L	7.19 NTU	-110.6 mV	8.64 ft	150.00 ml/min
6/27/2018 11:37 AM	12:00	6.42 pH	60.25 °F	484.51 µS/cm	0.23 mg/L	40.59 NTU	-150.7 mV	8.64 ft	150.00 ml/min
6/27/2018 11:40 AM	15:00	6.43 pH	60.03 °F	498.90 µS/cm	0.20 mg/L	2.25 NTU	-171.4 mV	8.64 ft	150.00 ml/min
6/27/2018 11:43 AM	18:00	6.44 pH	59.85 °F	499.26 µS/cm	0.22 mg/L	0.62 NTU	-180.6 mV	8.64 ft	150.00 ml/min
6/27/2018 11:46 AM	21:00	6.47 pH	59.74 °F	506.20 µS/cm	0.21 mg/L	3.94 NTU	-192.3 mV	8.64 ft	150.00 ml/min

**Samples**

Sample ID:	Description:
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MW-104	Sample time 1055 Iron 0.5
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Created using VuSitu from In-Situ, Inc.

# Low-Flow Test Report:

Test Date / Time: 6/27/2018 12:41:07 PM

Project: Edmonds Terminal 2Q18 (3)

Operator Name: PRMC

<b>Location Name: MW-129R</b> <b>Well Diameter: 2 in</b> <b>Casing Type: PVC</b> <b>Initial Depth to Water: 5.59 ft</b>	<b>Pump Type: Geotech Geopump Series 2</b> <b>Tubing Type: Polyethylene 0.170" x .25"</b> <b>Pump Intake From TOC: 8 ft</b> <b>Estimated Total Volume Pumped: 5400 ml</b> <b>Flow Cell Volume: 130 ml</b> <b>Final Flow Rate: 150 ml/min</b> <b>Final Draw Down: 1.41 ft</b>	<b>Instrument Used: Aqua TROLL 600 Vented</b> <b>Serial Number: 466689</b>
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## Test Notes:

## Weather Conditions:

Overcast, cool

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15 %		
6/27/2018 12:41 PM	00:00	6.61 pH	64.82 °F	1,303.6 µS/cm	3.81 mg/L	1.64 NTU	-140.5 mV	5.59 ft	150.00 ml/min
6/27/2018 12:44 PM	03:00	6.66 pH	59.00 °F	1,393.8 µS/cm	0.17 mg/L	0.72 NTU	-233.8 mV	5.59 ft	150.00 ml/min
6/27/2018 12:47 PM	06:00	6.66 pH	57.85 °F	1,396.7 µS/cm	0.09 mg/L	0.58 NTU	-250.5 mV	5.59 ft	150.00 ml/min
6/27/2018 12:50 PM	09:00	6.65 pH	57.09 °F	1,411.3 µS/cm	0.05 mg/L	0.59 NTU	-257.7 mV	5.59 ft	150.00 ml/min
6/27/2018 12:53 PM	12:00	6.61 pH	56.86 °F	1,422.3 µS/cm	0.20 mg/L	0.00 NTU	-238.2 mV	5.59 ft	150.00 ml/min
6/27/2018 12:56 PM	15:00	6.64 pH	56.32 °F	1,432.1 µS/cm	0.04 mg/L	0.00 NTU	-246.3 mV	5.59 ft	150.00 ml/min
6/27/2018 12:59 PM	18:00	6.64 pH	55.92 °F	1,439.6 µS/cm	0.04 mg/L	0.00 NTU	-242.9 mV	5.59 ft	150.00 ml/min
6/27/2018 1:02 PM	21:00	6.64 pH	55.71 °F	1,441.9 µS/cm	0.05 mg/L	0.00 NTU	-245.3 mV	5.59 ft	150.00 ml/min
6/27/2018 1:05 PM	24:00	6.63 pH	55.50 °F	1,445.8 µS/cm	0.10 mg/L	0.00 NTU	-247.7 mV	5.59 ft	150.00 ml/min
6/27/2018 1:08 PM	27:00	6.63 pH	55.22 °F	1,442.0 µS/cm	0.26 mg/L	0.00 NTU	-217.0 mV	5.59 ft	150.00 ml/min
6/27/2018 1:11 PM	30:00	6.63 pH	55.34 °F	1,438.5 µS/cm	0.17 mg/L	0.00 NTU	-203.7 mV	5.59 ft	150.00 ml/min
6/27/2018 1:14 PM	33:00	6.63 pH	55.15 °F	1,441.3 µS/cm	0.17 mg/L	0.00 NTU	-202.9 mV	5.59 ft	150.00 ml/min



6/27/2018 1:17 PM	36:00	6.64 pH	55.04 °F	1,445.3 µS/cm	0.18 mg/L	0.00 NTU	-188.1 mV	5.59 ft	150.00 ml/min
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## Samples

Sample ID:	Description:
MW-129R	Sample Time 1225 Iron 6.5

# Low-Flow Test Report:

Test Date / Time: 6/28/2018 12:02:30 PM

Project: Edmonds Terminal 2Q18

Operator Name: PRMC

<b>Location Name: MW-139R</b> <b>Well Diameter: 2 in</b> <b>Casing Type: PVC</b> <b>Initial Depth to Water: 7.57 ft</b>	<b>Pump Type: Geotech Geopump Series 2</b> <b>Tubing Type: Polyethylene 0.170" x .25"</b> <b>Pump Intake From TOC: 10 ft</b> <b>Estimated Total Volume Pumped: 2250 ml</b> <b>Flow Cell Volume: 130 ml</b> <b>Final Flow Rate: 150 ml/min</b> <b>Final Draw Down: 0.04 ft</b>	<b>Instrument Used: Aqua TROLL 600 Vented</b> <b>Serial Number: 466689</b>
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## Test Notes:

## Weather Conditions:

Overcast, cool

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15 %		
6/28/2018 12:02 PM	00:00	7.48 pH	63.36 °F	445.05 µS/cm	5.46 mg/L	36.81 NTU	32.8 mV	7.57 ft	150.00 ml/min
6/28/2018 12:05 PM	03:00	7.28 pH	62.90 °F	454.89 µS/cm	2.12 mg/L	42.74 NTU	-17.8 mV	7.57 ft	150.00 ml/min
6/28/2018 12:08 PM	06:00	7.34 pH	63.16 °F	451.30 µS/cm	2.11 mg/L	46.87 NTU	-72.5 mV	7.57 ft	150.00 ml/min
6/28/2018 12:11 PM	09:00	7.45 pH	63.27 °F	445.70 µS/cm	2.09 mg/L	49.92 NTU	-83.4 mV	7.57 ft	150.00 ml/min
6/28/2018 12:14 PM	12:00	7.53 pH	63.31 °F	457.94 µS/cm	2.14 mg/L	50.15 NTU	-93.4 mV	7.57 ft	150.00 ml/min
6/28/2018 12:17 PM	15:00	7.61 pH	63.40 °F	462.40 µS/cm	2.21 mg/L	45.40 NTU	-92.5 mV	7.57 ft	150.00 ml/min

## Samples

Sample ID:	Description:
MW-139R	Sample Time 1125 Iron 0.0

# Low-Flow Test Report:

Test Date / Time: 6/28/2018 1:05:34 PM

Project: Edmonds Terminal 2Q18

Operator Name: PRMC

<b>Location Name: MW-518</b> <b>Well Diameter: 2 in</b> <b>Casing Type: PVC</b> <b>Initial Depth to Water: 8.97 ft</b>	<b>Pump Type: Geotech Geopump Series 2</b> <b>Tubing Type: Polyethylene 0.170" x .25"</b> <b>Pump Intake From TOC: 11 ft</b> <b>Estimated Total Volume Pumped: 4950 ml</b> <b>Flow Cell Volume: 130 ml</b> <b>Final Flow Rate: 150 ml/min</b> <b>Final Draw Down: 0.18 ft</b>	<b>Instrument Used: Aqua TROLL 600 Vented</b> <b>Serial Number: 466689</b>
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## Test Notes:

## Weather Conditions:

Overcast, cool

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15 %		
6/28/2018 1:05 PM	00:00	6.73 pH	61.51 °F	392.13 µS/cm	3.53 mg/L	5.19 NTU	-82.0 mV	8.97 ft	150.00 ml/min
6/28/2018 1:08 PM	03:00	6.80 pH	59.23 °F	406.89 µS/cm	0.47 mg/L	0.00 NTU	-112.2 mV	8.97 ft	150.00 ml/min
6/28/2018 1:11 PM	06:00	6.95 pH	58.68 °F	409.22 µS/cm	0.42 mg/L	0.00 NTU	-124.5 mV	8.97 ft	150.00 ml/min
6/28/2018 1:14 PM	09:00	7.10 pH	58.48 °F	410.84 µS/cm	0.34 mg/L	0.00 NTU	-137.4 mV	8.97 ft	150.00 ml/min
6/28/2018 1:17 PM	12:00	7.21 pH	58.31 °F	412.09 µS/cm	0.27 mg/L	0.00 NTU	-144.9 mV	8.97 ft	150.00 ml/min
6/28/2018 1:20 PM	15:00	7.25 pH	58.07 °F	414.38 µS/cm	0.26 mg/L	0.00 NTU	-151.0 mV	8.97 ft	150.00 ml/min
6/28/2018 1:23 PM	18:00	7.22 pH	58.02 °F	415.99 µS/cm	0.35 mg/L	0.00 NTU	-151.5 mV	8.97 ft	150.00 ml/min
6/28/2018 1:26 PM	21:00	7.17 pH	57.94 °F	414.71 µS/cm	0.31 mg/L	0.00 NTU	-151.8 mV	8.97 ft	150.00 ml/min
6/28/2018 1:29 PM	24:00	7.14 pH	57.89 °F	417.62 µS/cm	0.43 mg/L	0.00 NTU	-144.4 mV	8.97 ft	150.00 ml/min
6/28/2018 1:32 PM	27:00	7.12 pH	57.85 °F	415.76 µS/cm	0.32 mg/L	0.00 NTU	-143.6 mV	8.97 ft	150.00 ml/min
6/28/2018 1:35 PM	30:00	7.11 pH	57.83 °F	418.77 µS/cm	0.34 mg/L	0.00 NTU	-145.1 mV	8.97 ft	150.00 ml/min
6/28/2018 1:38 PM	33:00	7.11 pH	57.74 °F	419.86 µS/cm	0.35 mg/L	0.00 NTU	-144.8 mV	8.97 ft	150.00 ml/min

**Samples**

Sample ID:	Description:
MW-518	Sample Time 1250 Iron 0.5
DUP-4	

# Low-Flow Test Report:

Test Date / Time: 6/28/2018 2:00:10 PM

Project: Edmonds Terminal (2) (2) (2) (2) (2) (2) (2) (2)

Operator Name: Jason Little

<b>Location Name: Mw-522</b> <b>Well Diameter: 2 in</b> <b>Casing Type: Pvc</b> <b>Screen Length: 10 ft</b> <b>Top of Screen: 3 ft</b> <b>Total Depth: 13 ft</b> <b>Initial Depth to Water: 8.58 ft</b>	<b>Pump Type: Geotech pump series 2</b> <b>Tubing Type: Polyethylene 0.170"</b> <b>x 1/4</b> <b>Pump Intake From TOC: 9.5 ft</b> <b>Estimated Total Volume Pumped:</b> <b>6300 ml</b> <b>Flow Cell Volume: 130 ml</b> <b>Final Flow Rate: 150 ml/min</b> <b>Final Draw Down: 0.12 ft</b>	<b>Instrument Used: Aqua TROLL 600</b> <b>Vented</b> <b>Serial Number: 466472</b>
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## Test Notes:

## Weather Conditions:

66 overcast

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15		
6/28/2018 2:00 PM	00:00	6.65 pH	58.09 °F	519.44 µS/cm	1.01 mg/L	0.00 NTU	126.7 mV	8.58 ft	150.00 ml/min
6/28/2018 2:03 PM	03:00	6.64 pH	56.90 °F	528.75 µS/cm	0.29 mg/L	0.00 NTU	103.1 mV	8.58 ft	150.00 ml/min
6/28/2018 2:06 PM	06:00	6.62 pH	56.76 °F	537.37 µS/cm	0.15 mg/L	0.00 NTU	92.3 mV	8.58 ft	150.00 ml/min
6/28/2018 2:09 PM	09:00	6.62 pH	56.60 °F	538.90 µS/cm	0.15 mg/L	0.00 NTU	87.1 mV	8.58 ft	150.00 ml/min
6/28/2018 2:12 PM	12:00	6.62 pH	56.47 °F	543.32 µS/cm	0.13 mg/L	0.00 NTU	79.9 mV	8.58 ft	150.00 ml/min
6/28/2018 2:15 PM	15:00	6.62 pH	56.45 °F	542.14 µS/cm	0.17 mg/L	0.00 NTU	72.6 mV	8.58 ft	150.00 ml/min
6/28/2018 2:18 PM	18:00	6.62 pH	56.40 °F	544.30 µS/cm	0.16 mg/L	0.00 NTU	69.6 mV	8.58 ft	150.00 ml/min
6/28/2018 2:21 PM	21:00	6.62 pH	56.36 °F	541.14 µS/cm	0.13 mg/L	0.00 NTU	66.0 mV	8.58 ft	150.00 ml/min
6/28/2018 2:24 PM	24:00	6.62 pH	56.34 °F	545.88 µS/cm	0.09 mg/L	0.00 NTU	65.2 mV	8.58 ft	150.00 ml/min
6/28/2018 2:27 PM	27:00	6.62 pH	56.30 °F	542.83 µS/cm	0.08 mg/L	0.00 NTU	62.3 mV	8.58 ft	150.00 ml/min
6/28/2018 2:30 PM	30:00	6.62 pH	56.32 °F	545.23 µS/cm	0.16 mg/L	0.00 NTU	60.6 mV	8.58 ft	150.00 ml/min
6/28/2018 2:33 PM	33:00	6.62 pH	56.41 °F	541.73 µS/cm	0.08 mg/L	0.00 NTU	58.2 mV	8.58 ft	150.00 ml/min

6/28/2018 2:36 PM	36:00	6.63 pH	56.40 °F	540.08 µS/cm	0.11 mg/L	0.00 NTU	56.8 mV	8.58 ft	150.00 ml/min
6/28/2018 2:39 PM	39:00	6.62 pH	56.41 °F	537.12 µS/cm	0.11 mg/L	0.00 NTU	56.3 mV	8.58 ft	150.00 ml/min
6/28/2018 2:42 PM	42:00	6.62 pH	56.45 °F	529.64 µS/cm	0.11 mg/L	0.00 NTU	55.1 mV	8.58 ft	150.00 ml/min

## Samples

Sample ID:	Description:
Mw-522	Sample time-1400 ldtw-8.58 Final dtw-8.70 Final rdo-0.11 Ferrous iron-0.0

# Low-Flow Test Report:

Test Date / Time: 6/27/2018 12:28:16 PM

Project: Edmonds Terminal 2Q18 (2)

Operator Name: AP

<p><b>Location Name: MW-530</b>  <b>Well Diameter: 1 in</b>  <b>Casing Type: PVC</b>  <b>Screen Length: 5 ft</b>  <b>Top of Screen: 3 ft</b>  <b>Total Depth: 8 ft</b>  <b>Initial Depth to Water: 5.46 ft</b></p>	<p><b>Pump Type: Geotech geopump series 2</b>  <b>Tubing Type: Polyethylene 0.170 x 1/4</b>  <b>Pump Intake From TOC: 6 ft</b>  <b>Estimated Total Volume Pumped: 4200 ml</b>  <b>Flow Cell Volume: 130 ml</b>  <b>Final Flow Rate: 200 ml/min</b>  <b>Final Draw Down: 1.14 ft</b></p>	<p><b>Instrument Used: Aqua TROLL 600 Vented</b>  <b>Serial Number: 457166</b></p>
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## Test Notes:

## Weather Conditions:

Sunny, 68

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15 %		
6/27/2018 12:28 PM	00:00	6.88 pH	60.89 °F	10,837 µS/cm	0.17 mg/L	10.07 NTU	-235.4 mV	5.46 ft	200.00 ml/min
6/27/2018 12:31 PM	03:00	6.87 pH	60.31 °F	11,810 µS/cm	0.13 mg/L	6.75 NTU	-240.5 mV	5.46 ft	200.00 ml/min
6/27/2018 12:34 PM	06:00	6.85 pH	59.70 °F	13,302 µS/cm	0.10 mg/L	4.75 NTU	-244.5 mV	5.46 ft	200.00 ml/min
6/27/2018 12:37 PM	09:00	6.84 pH	59.36 °F	14,460 µS/cm	0.07 mg/L	6.49 NTU	-249.2 mV	5.46 ft	200.00 ml/min
6/27/2018 12:40 PM	12:00	6.86 pH	58.98 °F	15,111 µS/cm	0.06 mg/L	4.04 NTU	-257.0 mV	5.46 ft	200.00 ml/min
6/27/2018 12:43 PM	15:00	6.88 pH	59.00 °F	15,765 µS/cm	0.05 mg/L	2.55 NTU	-266.3 mV	5.46 ft	200.00 ml/min
6/27/2018 12:46 PM	18:00	6.89 pH	58.86 °F	16,154 µS/cm	0.05 mg/L	1.65 NTU	-274.2 mV	5.46 ft	200.00 ml/min
6/27/2018 12:49 PM	21:00	6.87 pH	58.82 °F	16,447 µS/cm	0.05 mg/L	1.54 NTU	-278.2 mV	5.46 ft	200.00 ml/min

## Samples

Sample ID:	Description:
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MW-530

Sample time: 1155  
Final RDO: 0.05  
Ferrous iron: 0  
Final DTW: 6.60



# Low-Flow Test Report:

**Test Date / Time:** 6/27/2018 10:34:40 AM

**Project:** Edmonds Terminal 2Q18

**Operator Name:** EK

<p><b>Location Name: MW-533</b>  <b>Well Diameter: 2 in</b>  <b>Casing Type: PVC</b>  <b>Screen Length: 10 ft</b>  <b>Top of Screen: 3 ft</b>  <b>Total Depth: 13 ft</b>  <b>Initial Depth to Water: 5.6 ft</b></p>	<p><b>Pump Type: Geotech geopump series 2</b>  <b>Tubing Type: Polyethylene 0.170" x 1/4"</b>  <b>Pump Intake From TOC: 8 ft</b>  <b>Estimated Total Volume Pumped: 4800 ml</b>  <b>Flow Cell Volume: 130 ml</b>  <b>Final Flow Rate: 200 ml/min</b>  <b>Final Draw Down: 0 ft</b></p>	<p><b>Instrument Used: Aqua TROLL 600 Vented</b>  <b>Serial Number: 466586</b></p>
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## Test Notes:

## Weather Conditions:

70 and sunny

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15 %		
6/27/2018 10:34 AM	00:00	7.17 pH	63.51 °F	567.53 µS/cm	8.86 mg/L	100.78 NTU	99.2 mV	5.60 ft	200.00 ml/min
6/27/2018 10:37 AM	03:00	7.19 pH	63.03 °F	654.23 µS/cm	1.13 mg/L	84.11 NTU	92.7 mV	5.60 ft	200.00 ml/min
6/27/2018 10:40 AM	06:00	7.18 pH	63.03 °F	679.99 µS/cm	0.77 mg/L	86.26 NTU	91.7 mV	5.60 ft	200.00 ml/min
6/27/2018 10:43 AM	09:00	7.18 pH	63.07 °F	680.93 µS/cm	0.65 mg/L	84.61 NTU	91.6 mV	5.60 ft	200.00 ml/min
6/27/2018 10:46 AM	12:00	7.19 pH	63.03 °F	675.68 µS/cm	0.62 mg/L	79.21 NTU	91.0 mV	5.60 ft	200.00 ml/min
6/27/2018 10:49 AM	15:00	7.18 pH	62.96 °F	692.33 µS/cm	0.56 mg/L	80.71 NTU	92.6 mV	5.60 ft	200.00 ml/min
6/27/2018 10:52 AM	18:00	7.17 pH	63.01 °F	719.20 µS/cm	0.50 mg/L	81.60 NTU	91.8 mV	5.60 ft	200.00 ml/min
6/27/2018 10:55 AM	21:00	7.17 pH	63.15 °F	717.56 µS/cm	0.46 mg/L	82.15 NTU	91.2 mV	5.60 ft	200.00 ml/min
6/27/2018 10:58 AM	24:00	7.18 pH	63.06 °F	709.84 µS/cm	0.44 mg/L	80.43 NTU	89.7 mV	5.60 ft	200.00 ml/min

## Samples

Sample ID:	Description:
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MW-533	Sample time 1000 Final DTW 5.60 ft btoc Final RDO 0.43 mg/L Ferrous iron 0.0 mg/L
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# Low-Flow Test Report:

Test Date / Time: 6/27/2018 11:35:49 AM

Project: Edmonds Terminal (2)

Operator Name: Jason Little

<b>Location Name: Mw-535</b> <b>Well Diameter: 2 in</b> <b>Casing Type: Pvc</b> <b>Screen Length: 10 ft</b> <b>Top of Screen: 3 ft</b> <b>Total Depth: 13 ft</b> <b>Initial Depth to Water: 5.37 ft</b>	<b>Pump Type: Geotech pump series 2</b> <b>Tubing Type: Polyethylene 0.170" x 1/4</b> <b>Pump Intake From TOC: 10 ft</b> <b>Estimated Total Volume Pumped: 4050 ml</b> <b>Flow Cell Volume: 130 ml</b> <b>Final Flow Rate: 150 ml/min</b> <b>Final Draw Down: 0.03 ft</b>	<b>Instrument Used: Aqua TROLL 600 Vented</b> <b>Serial Number: 466472</b>
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## Test Notes:

## Weather Conditions:

67 sunny

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15		
6/27/2018 11:35 AM	00:00	7.29 pH	67.61 °F	630.75 µS/cm	1.05 mg/L	75.73 NTU	33.8 mV	5.37 ft	150.00 ml/min
6/27/2018 11:38 AM	03:00	7.28 pH	68.04 °F	677.00 µS/cm	0.57 mg/L	56.92 NTU	29.3 mV	5.37 ft	150.00 ml/min
6/27/2018 11:41 AM	06:00	7.25 pH	68.25 °F	673.24 µS/cm	0.51 mg/L	51.87 NTU	31.3 mV	5.37 ft	150.00 ml/min
6/27/2018 11:44 AM	09:00	7.29 pH	68.15 °F	656.43 µS/cm	0.38 mg/L	46.71 NTU	27.3 mV	5.37 ft	150.00 ml/min
6/27/2018 11:47 AM	12:00	7.30 pH	68.15 °F	644.04 µS/cm	0.31 mg/L	46.81 NTU	26.4 mV	5.37 ft	150.00 ml/min
6/27/2018 11:50 AM	15:00	7.26 pH	68.29 °F	643.31 µS/cm	0.27 mg/L	46.63 NTU	26.9 mV	5.37 ft	150.00 ml/min
6/27/2018 11:53 AM	18:00	7.30 pH	68.27 °F	648.10 µS/cm	0.25 mg/L	46.93 NTU	25.1 mV	5.37 ft	150.00 ml/min
6/27/2018 11:56 AM	21:00	7.28 pH	68.28 °F	638.70 µS/cm	0.22 mg/L	46.70 NTU	25.6 mV	5.37 ft	150.00 ml/min
6/27/2018 11:59 AM	24:00	7.29 pH	68.19 °F	636.44 µS/cm	0.22 mg/L	45.91 NTU	25.9 mV	5.37 ft	150.00 ml/min
6/27/2018 12:02 PM	27:00	7.27 pH	68.39 °F	640.02 µS/cm	0.25 mg/L	46.87 NTU	28.8 mV	5.37 ft	150.00 ml/min

## Samples

Sample ID:	Description:
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Mw-535	Sample time- 1115 ldtw-5.37 Fdtw-5.40 Final rdo -0.22 mg/k
Dup-1	

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# Low-Flow Test Report:

Test Date / Time: 6/29/2018 8:41:44 AM

Project: Edmonds Terminal (2) (2) (2) (2) (2) (2) (2) (2) (2)

Operator Name: Jason Little

<b>Location Name: Mw-126</b> <b>Well Diameter: 2 in</b> <b>Casing Type: Pvc</b> <b>Screen Length: 10.5 ft</b> <b>Top of Screen: 3.7 ft</b> <b>Total Depth: 14.2 ft</b> <b>Initial Depth to Water: 4.36 ft</b>	<b>Pump Type: Geotech pump series 2</b> <b>Tubing Type: Polyethylene 0.170"</b> <b>x 1/4</b> <b>Pump Intake From TOC: 9.5 ft</b> <b>Estimated Total Volume Pumped:</b> <b>6300 ml</b> <b>Flow Cell Volume: 130 ml</b> <b>Final Flow Rate: 150 ml/min</b> <b>Final Draw Down: 3.06 ft</b>	<b>Instrument Used: Aqua TROLL 600</b> <b>Vented</b> <b>Serial Number: 466472</b>
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## Test Notes:

## Weather Conditions:

60 degrees overcast

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15		
6/29/2018 8:41 AM	00:00	6.72 pH	55.88 °F	476.08 µS/cm	3.82 mg/L	5.71 NTU	201.1 mV	4.36 ft	150.00 ml/min
6/29/2018 8:44 AM	03:00	6.71 pH	54.37 °F	479.40 µS/cm	3.30 mg/L	36.72 NTU	204.2 mV	4.36 ft	150.00 ml/min
6/29/2018 8:47 AM	06:00	6.69 pH	54.05 °F	479.09 µS/cm	3.31 mg/L	362.03 NTU	206.1 mV	4.36 ft	150.00 ml/min
6/29/2018 8:50 AM	09:00	6.67 pH	54.13 °F	489.38 µS/cm	4.70 mg/L	729.91 NTU	209.1 mV	4.36 ft	150.00 ml/min
6/29/2018 8:53 AM	12:00	6.67 pH	54.05 °F	495.87 µS/cm	4.71 mg/L	580.22 NTU	209.5 mV	4.36 ft	150.00 ml/min
6/29/2018 8:56 AM	15:00	6.67 pH	53.99 °F	500.02 µS/cm	3.64 mg/L	797.46 NTU	205.4 mV	4.36 ft	150.00 ml/min
6/29/2018 8:59 AM	18:00	6.67 pH	53.89 °F	498.36 µS/cm	2.41 mg/L	1,504.1 NTU	199.3 mV	4.36 ft	150.00 ml/min
6/29/2018 9:02 AM	21:00	6.68 pH	53.83 °F	496.31 µS/cm	1.69 mg/L	248.58 NTU	193.7 mV	4.36 ft	150.00 ml/min
6/29/2018 9:05 AM	24:00	6.69 pH	53.79 °F	461.24 µS/cm	1.17 mg/L	0.00 NTU	187.3 mV	4.36 ft	150.00 ml/min
6/29/2018 9:08 AM	27:00	6.69 pH	53.73 °F	463.45 µS/cm	0.91 mg/L	0.00 NTU	183.4 mV	4.36 ft	150.00 ml/min
6/29/2018 9:11 AM	30:00	6.70 pH	53.73 °F	459.07 µS/cm	0.71 mg/L	4.12 NTU	178.3 mV	4.36 ft	150.00 ml/min
6/29/2018 9:14 AM	33:00	6.70 pH	53.62 °F	495.99 µS/cm	0.73 mg/L	0.00 NTU	177.1 mV	4.36 ft	150.00 ml/min

6/29/2018 9:17 AM	36:00	6.71 pH	53.57 °F	489.92 µS/cm	0.54 mg/L	0.00 NTU	172.4 mV	4.36 ft	150.00 ml/min
6/29/2018 9:20 AM	39:00	6.71 pH	53.51 °F	490.43 µS/cm	0.49 mg/L	0.00 NTU	168.0 mV	4.36 ft	150.00 ml/min
6/29/2018 9:23 AM	42:00	6.72 pH	53.45 °F	487.06 µS/cm	0.54 mg/L	1.91 NTU	164.3 mV	4.36 ft	150.00 ml/min

## Samples

Sample ID:	Description:
Mw-126	Sample time-0830 ldtw-4.36 Fdtw-7.42 Frdo-0.49 Ferrous iron-1.5

# Low-Flow Test Report:

Test Date / Time: 6/29/2018 8:40:36 AM

Project: Edmonds Terminal 2Q18

Operator Name: EK

<p><b>Location Name: MW-143</b>  <b>Well Diameter: 2 in</b>  <b>Casing Type: PVC</b>  <b>Screen Length: 10.1 ft</b>  <b>Top of Screen: 3.5 ft</b>  <b>Total Depth: 14.1 ft</b>  <b>Initial Depth to Water: 5.4 ft</b></p>	<p><b>Pump Type: Geotech geopump series 2</b>  <b>Tubing Type: Polyethylene 0.170" x 1/4"</b>  <b>Pump Intake From TOC: 8 ft</b>  <b>Estimated Total Volume Pumped: 3000 ml</b>  <b>Flow Cell Volume: 130 ml</b>  <b>Final Flow Rate: 200 ml/min</b>  <b>Final Draw Down: 2 ft</b></p>	<p><b>Instrument Used: Aqua TROLL 600 Vented</b>  <b>Serial Number: 466586</b></p>
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## Test Notes:

## Weather Conditions:

65 and cloudy

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15 %		
6/29/2018 8:40 AM	00:00	6.38 pH	56.66 °F	460.69 µS/cm	0.57 mg/L	35.39 NTU	-65.3 mV	5.40 ft	200.00 ml/min
6/29/2018 8:43 AM	03:00	6.37 pH	56.72 °F	460.63 µS/cm	0.27 mg/L	10.63 NTU	-75.0 mV	5.40 ft	200.00 ml/min
6/29/2018 8:46 AM	06:00	6.38 pH	56.97 °F	458.92 µS/cm	0.23 mg/L	9.77 NTU	-81.7 mV	5.40 ft	200.00 ml/min
6/29/2018 8:49 AM	09:00	6.38 pH	57.09 °F	457.83 µS/cm	0.20 mg/L	6.64 NTU	-87.4 mV	5.40 ft	200.00 ml/min
6/29/2018 8:52 AM	12:00	6.39 pH	57.22 °F	458.55 µS/cm	0.18 mg/L	8.67 NTU	-93.0 mV	5.40 ft	200.00 ml/min
6/29/2018 8:55 AM	15:00	6.41 pH	57.29 °F	460.94 µS/cm	0.18 mg/L	5.06 NTU	-96.6 mV	5.40 ft	200.00 ml/min

## Samples

Sample ID:	Description:
MW-143	Sample time 0800 Final DTW 7.40 ft btoc Final RDO 0.18 mg/L Ferrous iron 5.5 mg/L
MW-143 MS	

MW-143 MSD	
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# Low-Flow Test Report:

Test Date / Time: 6/27/2018 3:16:10 PM

Project: Edmonds Terminal 2Q18 (3)

Operator Name: AP

<b>Location Name: MW-502</b> <b>Well Diameter: 2 in</b> <b>Casing Type: PVC</b> <b>Screen Length: 10 ft</b> <b>Top of Screen: 3 ft</b> <b>Total Depth: 13 ft</b> <b>Initial Depth to Water: 5.89 ft</b>	<b>Pump Type: Geotech geopump series 2</b> <b>Tubing Type: Polyethylene 0.170 x 1/4</b> <b>Pump Intake From TOC: 9 ft</b> <b>Estimated Total Volume Pumped: 7200 ml</b> <b>Flow Cell Volume: 130 ml</b> <b>Final Flow Rate: 200 ml/min</b> <b>Final Draw Down: 0 ft</b>	<b>Instrument Used: Aqua TROLL 600 Vented</b> <b>Serial Number: 457166</b>
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## Test Notes:

## Weather Conditions:

Cloudy, 66

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15 %		
6/27/2018 3:16 PM	00:00	6.21 pH	62.16 °F	310.79 µS/cm	0.26 mg/L	27.44 NTU	1.9 mV	5.89 ft	200.00 ml/min
6/27/2018 3:19 PM	03:00	6.14 pH	58.26 °F	297.62 µS/cm	0.07 mg/L	11.57 NTU	4.4 mV	5.89 ft	200.00 ml/min
6/27/2018 3:22 PM	06:00	6.06 pH	58.19 °F	296.27 µS/cm	0.06 mg/L	11.78 NTU	6.7 mV	5.89 ft	200.00 ml/min
6/27/2018 3:25 PM	09:00	6.02 pH	57.96 °F	294.68 µS/cm	0.07 mg/L	7.54 NTU	10.8 mV	5.89 ft	200.00 ml/min
6/27/2018 3:28 PM	12:00	5.98 pH	57.94 °F	291.95 µS/cm	0.05 mg/L	6.44 NTU	12.4 mV	5.89 ft	200.00 ml/min
6/27/2018 3:31 PM	15:00	5.98 pH	57.71 °F	289.44 µS/cm	0.05 mg/L	6.54 NTU	14.5 mV	5.89 ft	200.00 ml/min
6/27/2018 3:34 PM	18:00	5.96 pH	57.53 °F	288.16 µS/cm	0.05 mg/L	3.36 NTU	15.0 mV	5.89 ft	200.00 ml/min
6/27/2018 3:37 PM	21:00	5.96 pH	57.39 °F	285.96 µS/cm	0.04 mg/L	3.44 NTU	13.2 mV	5.89 ft	200.00 ml/min
6/27/2018 3:40 PM	24:00	5.96 pH	57.35 °F	283.88 µS/cm	0.04 mg/L	3.56 NTU	15.3 mV	5.89 ft	200.00 ml/min
6/27/2018 3:43 PM	27:00	5.95 pH	57.19 °F	285.62 µS/cm	0.02 mg/L	1.52 NTU	15.2 mV	5.89 ft	200.00 ml/min
6/27/2018 3:46 PM	30:00	5.96 pH	57.20 °F	282.43 µS/cm	0.02 mg/L	4.06 NTU	15.9 mV	5.89 ft	200.00 ml/min
6/27/2018 3:49 PM	33:00	5.95 pH	57.26 °F	279.19 µS/cm	0.02 mg/L	2.21 NTU	18.6 mV	5.89 ft	200.00 ml/min

6/27/2018 3:52 PM	36:00	5.96 pH	57.25 °F	274.61 µS/cm	0.02 mg/L	2.02 NTU	17.7 mV	5.89 ft	200.00 ml/min
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## Samples

Sample ID:	Description:
MW-502	Final Dtw: 6.20 RDO: 0.02 Sample time: 1500 Ferrous iron: 2.5

# Low-Flow Test Report:

Test Date / Time: 6/28/2018 9:09:27 AM

Project: Edmonds Terminal 2Q18

Operator Name: PRMC

<b>Location Name: MW-503</b> <b>Well Diameter: 2 in</b> <b>Casing Type: PVC</b> <b>Initial Depth to Water: 5.68 ft</b>	<b>Pump Type: Geotech Geopump Series 2</b> <b>Tubing Type: Polyethylene 0.170" x .25"</b> <b>Pump Intake From TOC: 8 ft</b> <b>Estimated Total Volume Pumped: 6750 ml</b> <b>Flow Cell Volume: 130 ml</b> <b>Final Flow Rate: 150 ml/min</b> <b>Final Draw Down: 0.08 ft</b>	<b>Instrument Used: Aqua TROLL 600 Vented</b> <b>Serial Number: 466689</b>
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## Test Notes:

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15 %		
6/28/2018 9:09 AM	00:00	6.57 pH	59.49 °F	515.91 µS/cm	4.77 mg/L	21.19 NTU	-15.9 mV	5.68 ft	150.00 ml/min
6/28/2018 9:12 AM	03:00	6.46 pH	58.08 °F	521.88 µS/cm	0.32 mg/L	0.00 NTU	-47.0 mV	5.68 ft	150.00 ml/min
6/28/2018 9:15 AM	06:00	6.47 pH	57.74 °F	519.83 µS/cm	0.34 mg/L	0.00 NTU	-59.4 mV	5.68 ft	150.00 ml/min
6/28/2018 9:18 AM	09:00	6.47 pH	57.66 °F	519.97 µS/cm	0.35 mg/L	0.00 NTU	-67.3 mV	5.68 ft	150.00 ml/min
6/28/2018 9:21 AM	12:00	6.47 pH	57.61 °F	519.52 µS/cm	0.39 mg/L	0.00 NTU	-70.0 mV	5.68 ft	150.00 ml/min
6/28/2018 9:24 AM	15:00	6.48 pH	57.54 °F	513.74 µS/cm	0.28 mg/L	0.00 NTU	-73.8 mV	5.68 ft	150.00 ml/min
6/28/2018 9:27 AM	18:00	6.48 pH	57.51 °F	521.55 µS/cm	0.34 mg/L	0.00 NTU	-79.6 mV	5.68 ft	150.00 ml/min
6/28/2018 9:30 AM	21:00	6.48 pH	57.52 °F	518.11 µS/cm	0.19 mg/L	0.00 NTU	-82.2 mV	5.68 ft	150.00 ml/min
6/28/2018 9:33 AM	24:00	6.47 pH	57.51 °F	521.14 µS/cm	0.18 mg/L	0.00 NTU	-86.0 mV	5.68 ft	150.00 ml/min
6/28/2018 9:36 AM	27:00	6.46 pH	57.53 °F	522.29 µS/cm	0.35 mg/L	0.00 NTU	-84.0 mV	5.68 ft	150.00 ml/min
6/28/2018 9:39 AM	30:00	6.43 pH	57.53 °F	520.21 µS/cm	0.23 mg/L	0.00 NTU	-81.6 mV	5.68 ft	150.00 ml/min
6/28/2018 9:42 AM	33:00	6.40 pH	57.48 °F	521.13 µS/cm	0.17 mg/L	0.00 NTU	-83.9 mV	5.68 ft	150.00 ml/min
6/28/2018 9:45 AM	36:00	6.36 pH	57.45 °F	521.26 µS/cm	0.18 mg/L	0.00 NTU	-80.0 mV	5.68 ft	150.00 ml/min
6/28/2018 9:48 AM	39:00	6.32 pH	57.45 °F	520.74 µS/cm	0.14 mg/L	0.00 NTU	-79.4 mV	5.68 ft	150.00 ml/min

6/28/2018 9:51 AM	42:00	6.27 pH	57.47 °F	521.14 µS/cm	0.19 mg/L	0.00 NTU	-80.1 mV	5.68 ft	150.00 ml/min
6/28/2018 9:54 AM	45:00	6.22 pH	57.51 °F	510.99 µS/cm	0.17 mg/L	0.00 NTU	-69.8 mV	5.68 ft	150.00 ml/min

## Samples

Sample ID:	Description:
MW-503	Sample Time 0900 Iron 3.5
DUP-3	

# Low-Flow Test Report:

**Test Date / Time:** 6/28/2018 10:42:36 AM

**Project:** Edmonds Terminal 2Q18

**Operator Name:** PRMC

<p><b>Location Name: MW-504</b>  <b>Well Diameter: 2 in</b>  <b>Casing Type: PVC</b>  <b>Initial Depth to Water: 7.09 ft</b></p>	<p><b>Pump Type: Geotech Geopump Series 2</b>  <b>Tubing Type: Polyethylene 0.170" x .25"</b>  <b>Pump Intake From TOC: 8 ft</b>  <b>Estimated Total Volume Pumped: 4500 ml</b>  <b>Flow Cell Volume: 130 ml</b>  <b>Final Flow Rate: 150 ml/min</b>  <b>Final Draw Down: 0.45 ft</b></p>	<p><b>Instrument Used: Aqua TROLL 600 Vented</b>  <b>Serial Number: 466689</b></p>
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**Test Notes:**

**Weather Conditions:**

Overcast, cool

**Low-Flow Readings:**

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15 %		
6/28/2018 10:42 AM	00:00	6.41 pH	60.72 °F	1,954.3 µS/cm	4.48 mg/L	1.24 NTU	19.0 mV	7.09 ft	150.00 ml/min
6/28/2018 10:45 AM	03:00	6.36 pH	60.38 °F	1,967.4 µS/cm	0.21 mg/L	1.82 NTU	-23.0 mV	7.09 ft	150.00 ml/min
6/28/2018 10:48 AM	06:00	6.35 pH	60.67 °F	1,966.1 µS/cm	0.22 mg/L	0.00 NTU	-25.4 mV	7.09 ft	150.00 ml/min
6/28/2018 10:51 AM	09:00	6.39 pH	60.54 °F	1,929.6 µS/cm	0.21 mg/L	2.30 NTU	-29.1 mV	7.09 ft	150.00 ml/min
6/28/2018 10:54 AM	12:00	6.50 pH	60.50 °F	1,847.4 µS/cm	0.35 mg/L	0.00 NTU	-25.1 mV	7.09 ft	150.00 ml/min
6/28/2018 10:57 AM	15:00	6.65 pH	60.51 °F	1,742.5 µS/cm	0.29 mg/L	0.00 NTU	-35.0 mV	7.09 ft	150.00 ml/min
6/28/2018 11:00 AM	18:00	6.78 pH	60.49 °F	1,695.8 µS/cm	0.40 mg/L	0.00 NTU	-39.2 mV	7.09 ft	150.00 ml/min
6/28/2018 11:03 AM	21:00	6.88 pH	60.44 °F	1,660.8 µS/cm	0.39 mg/L	18.14 NTU	-45.0 mV	7.09 ft	150.00 ml/min
6/28/2018 11:06 AM	24:00	6.95 pH	60.43 °F	1,610.6 µS/cm	0.35 mg/L	0.00 NTU	-49.7 mV	7.09 ft	150.00 ml/min
6/28/2018 11:09 AM	27:00	7.00 pH	60.45 °F	1,583.9 µS/cm	0.36 mg/L	0.00 NTU	-53.4 mV	7.09 ft	150.00 ml/min
6/28/2018 11:12 AM	30:00	7.02 pH	60.45 °F	1,577.4 µS/cm	0.36 mg/L	0.00 NTU	-54.7 mV	7.09 ft	150.00 ml/min

**Samples**

Sample ID:	Description:
MW-504	Sample Time 1020 Iron 1.5

# Low-Flow Test Report:

Test Date / Time: 6/28/2018 11:10:55 AM

Project: Edmonds Terminal 2Q18

Operator Name: EK

<p><b>Location Name: MW-505</b>  <b>Well Diameter: 2 in</b>  <b>Casing Type: PVC</b>  <b>Screen Length: 10 ft</b>  <b>Top of Screen: 3 ft</b>  <b>Total Depth: 13 ft</b>  <b>Initial Depth to Water: 5.25 ft</b></p>	<p><b>Pump Type: Geotech geopump series 2</b>  <b>Tubing Type: Polyethylene 0.170" x 1/4"</b>  <b>Pump Intake From TOC: 8 ft</b>  <b>Estimated Total Volume Pumped: 6000 ml</b>  <b>Flow Cell Volume: 130 ml</b>  <b>Final Flow Rate: 200 ml/min</b>  <b>Final Draw Down: 0 ft</b></p>	<p><b>Instrument Used: Aqua TROLL 600 Vented</b>  <b>Serial Number: 466586</b></p>
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## Test Notes:

## Weather Conditions:

70 and cloudy

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15 %		
6/28/2018 11:10 AM	00:00	6.70 pH	61.01 °F	385.55 µS/cm	0.78 mg/L	1.31 NTU	-42.7 mV	5.25 ft	200.00 ml/min
6/28/2018 11:13 AM	03:00	6.65 pH	60.91 °F	441.56 µS/cm	0.49 mg/L	5.55 NTU	-66.5 mV	5.25 ft	200.00 ml/min
6/28/2018 11:16 AM	06:00	6.67 pH	60.76 °F	514.96 µS/cm	0.39 mg/L	10.92 NTU	-76.7 mV	5.25 ft	200.00 ml/min
6/28/2018 11:19 AM	09:00	6.67 pH	60.78 °F	598.21 µS/cm	0.35 mg/L	8.03 NTU	-84.8 mV	5.25 ft	200.00 ml/min
6/28/2018 11:22 AM	12:00	6.68 pH	60.92 °F	661.94 µS/cm	0.34 mg/L	3.89 NTU	-87.8 mV	5.25 ft	200.00 ml/min
6/28/2018 11:25 AM	15:00	6.69 pH	60.95 °F	710.83 µS/cm	0.27 mg/L	3.93 NTU	-90.6 mV	5.25 ft	200.00 ml/min
6/28/2018 11:28 AM	18:00	6.69 pH	60.93 °F	745.12 µS/cm	0.27 mg/L	3.98 NTU	-91.2 mV	5.25 ft	200.00 ml/min
6/28/2018 11:31 AM	21:00	6.70 pH	60.89 °F	797.66 µS/cm	0.26 mg/L	0.59 NTU	-94.0 mV	5.25 ft	200.00 ml/min
6/28/2018 11:34 AM	24:00	6.71 pH	60.89 °F	775.54 µS/cm	0.32 mg/L	1.29 NTU	-93.7 mV	5.25 ft	200.00 ml/min
6/28/2018 11:37 AM	27:00	6.71 pH	60.96 °F	841.21 µS/cm	0.33 mg/L	0.26 NTU	-94.0 mV	5.25 ft	200.00 ml/min
6/28/2018 11:40 AM	30:00	6.72 pH	60.95 °F	845.44 µS/cm	0.32 mg/L	0.69 NTU	-96.3 mV	5.25 ft	200.00 ml/min

**Samples**

Sample ID:	Description:
MW-505	Sample time 1050 Final DTW 5.25 ft btoc Final RDO 0.31 mg/L Ferrous iron 5.0 mg/L



# Low-Flow Test Report:

Test Date / Time: 6/28/2018 10:01:02 AM

Project: Edmonds Terminal 2Q18

Operator Name: EK

<b>Location Name: MW-506</b> <b>Well Diameter: 2 in</b> <b>Casing Type: PVC</b> <b>Screen Length: 10 ft</b> <b>Top of Screen: 3 ft</b> <b>Total Depth: 13 ft</b> <b>Initial Depth to Water: 7.2 ft</b>	<b>Pump Type: Geotech geopump series 2</b> <b>Tubing Type: Polyethylene 0.170" x 1/4"</b> <b>Pump Intake From TOC: 10 ft</b> <b>Estimated Total Volume Pumped: 6600 ml</b> <b>Flow Cell Volume: 130 ml</b> <b>Final Flow Rate: 200 ml/min</b> <b>Final Draw Down: 0.2 ft</b>	<b>Instrument Used: Aqua TROLL 600 Vented</b> <b>Serial Number: 466586</b>
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## Test Notes:

## Weather Conditions:

70 and cloudy

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15 %		
6/28/2018 10:01 AM	00:00	6.96 pH	60.95 °F	547.93 µS/cm	0.77 mg/L	26.20 NTU	-35.0 mV	7.20 ft	200.00 ml/min
6/28/2018 10:04 AM	03:00	6.93 pH	60.82 °F	545.18 µS/cm	0.41 mg/L	2.06 NTU	-70.0 mV	7.20 ft	200.00 ml/min
6/28/2018 10:07 AM	06:00	6.91 pH	60.68 °F	526.41 µS/cm	0.33 mg/L	1.67 NTU	-79.4 mV	7.20 ft	200.00 ml/min
6/28/2018 10:10 AM	09:00	6.91 pH	60.62 °F	502.12 µS/cm	0.30 mg/L	2.13 NTU	-85.6 mV	7.20 ft	200.00 ml/min
6/28/2018 10:13 AM	12:00	6.91 pH	60.56 °F	473.73 µS/cm	0.30 mg/L	3.38 NTU	-89.0 mV	7.20 ft	200.00 ml/min
6/28/2018 10:16 AM	15:00	6.91 pH	60.52 °F	435.00 µS/cm	0.30 mg/L	1.45 NTU	-89.1 mV	7.20 ft	200.00 ml/min
6/28/2018 10:19 AM	18:00	6.91 pH	60.50 °F	378.85 µS/cm	0.32 mg/L	0.55 NTU	-87.0 mV	7.20 ft	200.00 ml/min
6/28/2018 10:22 AM	21:00	6.91 pH	60.51 °F	353.49 µS/cm	0.31 mg/L	0.63 NTU	-86.2 mV	7.20 ft	200.00 ml/min
6/28/2018 10:25 AM	24:00	6.91 pH	60.53 °F	422.54 µS/cm	0.27 mg/L	3.27 NTU	-85.8 mV	7.20 ft	200.00 ml/min
6/28/2018 10:28 AM	27:00	6.91 pH	60.57 °F	485.70 µS/cm	0.27 mg/L	0.00 NTU	-88.1 mV	7.20 ft	200.00 ml/min
6/28/2018 10:31 AM	30:00	6.91 pH	60.58 °F	476.83 µS/cm	0.25 mg/L	0.07 NTU	-88.8 mV	7.20 ft	200.00 ml/min
6/28/2018 10:34 AM	33:00	6.92 pH	60.59 °F	522.39 µS/cm	0.26 mg/L	0.44 NTU	-86.9 mV	7.20 ft	200.00 ml/min

**Samples**

Sample ID:	Description:
MW-506	Sample time 0940 Final DTW 7.40 ft btoc Final RDO 0.27 mg/L Ferrous iron 4.0 mg/L

# Low-Flow Test Report:

Test Date / Time: 6/28/2018 8:57:58 AM

Project: Edmonds Terminal 2Q18

Operator Name: EK

<b>Location Name: MW-507</b> <b>Well Diameter: 2 in</b> <b>Casing Type: PVC</b> <b>Screen Length: 10 ft</b> <b>Top of Screen: 3 ft</b> <b>Total Depth: 13 ft</b> <b>Initial Depth to Water: 7.35 ft</b>	<b>Pump Type: Geotech geopump series 2</b> <b>Tubing Type: Polyethylene 0.170" x 1/4"</b> <b>Pump Intake From TOC: 10 ft</b> <b>Estimated Total Volume Pumped: 4800 ml</b> <b>Flow Cell Volume: 130 ml</b> <b>Final Flow Rate: 200 ml/min</b> <b>Final Draw Down: 0.2 ft</b>	<b>Instrument Used: Aqua TROLL 600 Vented</b> <b>Serial Number: 466586</b>
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## Test Notes:

## Weather Conditions:

65 and cloudy

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15 %		
6/28/2018 8:57 AM	00:00	6.78 pH	59.95 °F	920.72 µS/cm	1.95 mg/L	28.08 NTU	149.3 mV	7.35 ft	200.00 ml/min
6/28/2018 9:00 AM	03:00	6.77 pH	59.76 °F	921.33 µS/cm	1.36 mg/L	9.29 NTU	143.8 mV	7.35 ft	200.00 ml/min
6/28/2018 9:03 AM	06:00	6.78 pH	59.84 °F	921.76 µS/cm	1.16 mg/L	2.34 NTU	136.2 mV	7.35 ft	200.00 ml/min
6/28/2018 9:06 AM	09:00	6.77 pH	59.75 °F	916.53 µS/cm	0.89 mg/L	1.18 NTU	131.6 mV	7.35 ft	200.00 ml/min
6/28/2018 9:09 AM	12:00	6.78 pH	59.63 °F	915.27 µS/cm	0.75 mg/L	2.38 NTU	126.8 mV	7.35 ft	200.00 ml/min
6/28/2018 9:12 AM	15:00	6.78 pH	59.60 °F	913.84 µS/cm	0.70 mg/L	3.54 NTU	119.5 mV	7.35 ft	200.00 ml/min
6/28/2018 9:15 AM	18:00	6.78 pH	59.64 °F	912.36 µS/cm	0.64 mg/L	1.01 NTU	113.5 mV	7.35 ft	200.00 ml/min
6/28/2018 9:18 AM	21:00	6.78 pH	59.52 °F	910.63 µS/cm	0.59 mg/L	0.44 NTU	110.3 mV	7.35 ft	200.00 ml/min
6/28/2018 9:21 AM	24:00	6.78 pH	59.42 °F	908.98 µS/cm	0.57 mg/L	1.98 NTU	106.8 mV	7.35 ft	200.00 ml/min

## Samples

Sample ID:	Description:
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MW-507	Sample time 0830 Final DTW 7.55 ft btoc Final RDO 0.57 mg/L Ferrous iron 0.0 mg/L
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# Low-Flow Test Report:

Test Date / Time: 6/28/2018 9:11:29 AM

Project: Edmonds Terminal 2Q18 (4)

Operator Name: AP

<p><b>Location Name: MW-509</b>  <b>Well Diameter: 2 in</b>  <b>Casing Type: PVC</b>  <b>Screen Length: 10 ft</b>  <b>Top of Screen: 3 ft</b>  <b>Total Depth: 13 ft</b>  <b>Initial Depth to Water: 4.03 ft</b></p>	<p><b>Pump Type: Geotech geopump series 2</b>  <b>Tubing Type: Polyethylene 0.170 x 1/4</b>  <b>Pump Intake From TOC: 9 ft</b>  <b>Estimated Total Volume Pumped: 3000 ml</b>  <b>Flow Cell Volume: 130 ml</b>  <b>Final Flow Rate: 200 ml/min</b>  <b>Final Draw Down: 0 ft</b></p>	<p><b>Instrument Used: Aqua TROLL 600 Vented</b>  <b>Serial Number: 457166</b></p>
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## Test Notes:

## Weather Conditions:

Cloudy, 60

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15 %		
6/28/2018 9:11 AM	00:00	6.75 pH	62.85 °F	3,712.9 µS/cm	0.32 mg/L	3.24 NTU	106.8 mV	4.03 ft	200.00 ml/min
6/28/2018 9:14 AM	03:00	6.80 pH	63.60 °F	2,528.8 µS/cm	0.40 mg/L	0.00 NTU	92.6 mV	4.03 ft	200.00 ml/min
6/28/2018 9:17 AM	06:00	6.83 pH	63.82 °F	2,300.8 µS/cm	0.44 mg/L	0.05 NTU	84.3 mV	4.03 ft	200.00 ml/min
6/28/2018 9:20 AM	09:00	6.83 pH	63.96 °F	2,301.7 µS/cm	0.54 mg/L	0.00 NTU	78.3 mV	4.03 ft	200.00 ml/min
6/28/2018 9:23 AM	12:00	6.85 pH	63.92 °F	2,188.3 µS/cm	0.50 mg/L	0.04 NTU	77.1 mV	4.03 ft	200.00 ml/min
6/28/2018 9:26 AM	15:00	6.84 pH	63.93 °F	2,235.1 µS/cm	0.56 mg/L	0.25 NTU	72.8 mV	4.03 ft	200.00 ml/min

## Samples

Sample ID:	Description:
MW-509	Time: 0835 Final DTW: 4.03 Ferrous iron: 0.0
MW-509-MS	

MW-509-MSD

Created using VuSitu from In-Situ, Inc.

# Low-Flow Test Report:

Test Date / Time: 6/27/2018 2:03:27 PM

Project: Edmonds Terminal 2Q18

Operator Name: PRMC

<b>Location Name: MW-511</b> <b>Well Diameter: 2 in</b> <b>Casing Type: PVC</b> <b>Initial Depth to Water: 8.58 ft</b>	<b>Pump Type: Geotech Geopump Series 2</b> <b>Tubing Type: Polyethylene 0.170" x .25"</b> <b>Pump Intake From TOC: 9 ft</b> <b>Estimated Total Volume Pumped: 1800 ml</b> <b>Flow Cell Volume: 130 ml</b> <b>Final Flow Rate: 150 ml/min</b> <b>Final Draw Down: 0.4 ft</b>	<b>Instrument Used: Aqua TROLL 600 Vented</b> <b>Serial Number: 466689</b>
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## Test Notes:

## Weather Conditions:

Overcast, cool

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15 %		
6/27/2018 2:03 PM	00:00	6.69 pH	58.24 °F	282.89 µS/cm	2.71 mg/L	3.38 NTU	29.6 mV	8.58 ft	150.00 ml/min
6/27/2018 2:06 PM	03:00	6.58 pH	55.55 °F	273.57 µS/cm	0.87 mg/L	0.00 NTU	65.4 mV	8.58 ft	150.00 ml/min
6/27/2018 2:09 PM	06:00	6.55 pH	54.73 °F	273.28 µS/cm	0.79 mg/L	0.00 NTU	71.6 mV	8.58 ft	150.00 ml/min
6/27/2018 2:12 PM	09:00	6.51 pH	54.44 °F	272.42 µS/cm	0.79 mg/L	0.00 NTU	78.2 mV	8.58 ft	150.00 ml/min
6/27/2018 2:15 PM	12:00	6.47 pH	54.33 °F	272.15 µS/cm	0.77 mg/L	0.00 NTU	84.2 mV	8.58 ft	150.00 ml/min

## Samples

Sample ID:	Description:
MW-511	Sample Time 1330 Iron 0.0

# Low-Flow Test Report:

Test Date / Time: 6/28/2018 9:06:30 AM

Project: Edmonds Terminal (2) (2) (2) (2)

Operator Name: Jason Little

<b>Location Name: Mw-512</b> <b>Well Diameter: 2 in</b> <b>Casing Type: Pvc</b> <b>Screen Length: 10 ft</b> <b>Top of Screen: 3 ft</b> <b>Total Depth: 13 ft</b> <b>Initial Depth to Water: 7.02 ft</b>	<b>Pump Type: Geotech pump series 2</b> <b>Tubing Type: Polyethylene 0.170"</b> <b>x 1/4</b> <b>Pump Intake From TOC: 9.5 ft</b> <b>Estimated Total Volume Pumped:</b> <b>3150 ml</b> <b>Flow Cell Volume: 130 ml</b> <b>Final Flow Rate: 150 ml/min</b> <b>Final Draw Down: 0 ft</b>	<b>Instrument Used: Aqua TROLL 600</b> <b>Vented</b> <b>Serial Number: 466472</b>
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## Test Notes:

## Weather Conditions:

62 overcast

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15		
6/28/2018 9:06 AM	00:00	6.83 pH	61.62 °F	401.82 µS/cm	0.90 mg/L	2.00 NTU	75.5 mV	7.02 ft	150.00 ml/min
6/28/2018 9:09 AM	03:00	6.83 pH	61.78 °F	398.77 µS/cm	0.24 mg/L	0.00 NTU	56.7 mV	7.02 ft	150.00 ml/min
6/28/2018 9:12 AM	06:00	6.82 pH	61.94 °F	391.41 µS/cm	0.43 mg/L	0.00 NTU	52.5 mV	7.02 ft	150.00 ml/min
6/28/2018 9:15 AM	09:00	6.82 pH	62.09 °F	379.52 µS/cm	0.97 mg/L	0.00 NTU	53.7 mV	7.02 ft	150.00 ml/min
6/28/2018 9:18 AM	12:00	6.81 pH	62.11 °F	375.77 µS/cm	1.41 mg/L	0.00 NTU	57.7 mV	7.02 ft	150.00 ml/min
6/28/2018 9:21 AM	15:00	6.82 pH	62.22 °F	374.72 µS/cm	1.58 mg/L	0.00 NTU	61.6 mV	7.02 ft	150.00 ml/min
6/28/2018 9:24 AM	18:00	6.80 pH	62.17 °F	373.29 µS/cm	1.68 mg/L	0.00 NTU	63.4 mV	7.02 ft	150.00 ml/min
6/28/2018 9:27 AM	21:00	6.80 pH	62.12 °F	376.27 µS/cm	1.71 mg/L	0.00 NTU	64.6 mV	7.02 ft	150.00 ml/min

## Samples

Sample ID:	Description:
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Mw-512	Sample time- 840 ldtw-7.02 Fdtw-7.02 Final rdo-1.71 mg/l Ferrous iron- 0.0 mg/l
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# Low-Flow Test Report:

Test Date / Time: 6/28/2018 11:09:52 AM

Project: Edmonds Terminal (2) (2) (2) (2) (2) (2)

Operator Name: Jason Little

<b>Location Name: Mw-513</b> <b>Well Diameter: 2 in</b> <b>Casing Type: Pvc</b> <b>Screen Length: 10 ft</b> <b>Top of Screen: 3 ft</b> <b>Total Depth: 13 ft</b> <b>Initial Depth to Water: 4.87 ft</b>	<b>Pump Type: Geotech pump series 2</b> <b>Tubing Type: Polyethylene 0.170"</b> <b>x 1/4</b> <b>Pump Intake From TOC: 8 ft</b> <b>Estimated Total Volume Pumped:</b> <b>1800 ml</b> <b>Flow Cell Volume: 130 ml</b> <b>Final Flow Rate: 150 ml/min</b> <b>Final Draw Down: 0 ft</b>	<b>Instrument Used: Aqua TROLL 600</b> <b>Vented</b> <b>Serial Number: 466472</b>
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## Test Notes:

## Weather Conditions:

64 degrees overcast

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15		
6/28/2018 11:09 AM	00:00	6.71 pH	58.71 °F	1,530.2 µS/cm	0.25 mg/L	5.47 NTU	13.9 mV	4.87 ft	150.00 ml/min
6/28/2018 11:12 AM	03:00	6.72 pH	58.54 °F	1,555.3 µS/cm	0.10 mg/L	8.85 NTU	-56.8 mV	4.87 ft	150.00 ml/min
6/28/2018 11:15 AM	06:00	6.72 pH	58.84 °F	1,559.5 µS/cm	0.09 mg/L	32.13 NTU	-74.5 mV	4.87 ft	150.00 ml/min
6/28/2018 11:18 AM	09:00	6.72 pH	59.17 °F	1,569.0 µS/cm	0.09 mg/L	5.93 NTU	-82.1 mV	4.87 ft	150.00 ml/min
6/28/2018 11:21 AM	12:00	6.72 pH	59.39 °F	1,558.4 µS/cm	0.10 mg/L	2.71 NTU	-81.9 mV	4.87 ft	150.00 ml/min

## Samples

Sample ID:	Description:
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Mw-513	Sample time-1040 ldtw-4.87 Final dtw-4.87 Final rdo-0.10 Ferrous iron-5.5
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# Low-Flow Test Report:

**Test Date / Time:** 6/28/2018 10:18:20 AM

**Project:** Edmonds Terminal (2) (2) (2) (2) (2)

**Operator Name:** Jason Little

<p><b>Location Name:</b> Mw-514  <b>Well Diameter:</b> 2 in  <b>Casing Type:</b> Pvc  <b>Screen Length:</b> 10 ft  <b>Top of Screen:</b> 3 ft  <b>Total Depth:</b> 13 ft  <b>Initial Depth to Water:</b> 5.19 ft</p>	<p><b>Pump Type:</b> Geotech pump series 2  <b>Tubing Type:</b> Polyethylene 0.170" x 1/4  <b>Pump Intake From TOC:</b> 8 ft  <b>Estimated Total Volume Pumped:</b> 3150 ml  <b>Flow Cell Volume:</b> 130 ml  <b>Final Flow Rate:</b> 150 ml/min  <b>Final Draw Down:</b> 0 ft</p>	<p><b>Instrument Used:</b> Aqua TROLL 600 Vented  <b>Serial Number:</b> 466472</p>
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## Test Notes:

Sample time- 0950

ldtw-7.19

Final dtw-7.19

Ferrous iron-o.o

## Weather Conditions:

62 degrees overcast

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15		
6/28/2018 10:18 AM	00:00	6.63 pH	59.98 °F	667.90 µS/cm	0.41 mg/L	55.76 NTU	144.9 mV	5.19 ft	150.00 ml/min
6/28/2018 10:21 AM	03:00	6.63 pH	60.15 °F	673.02 µS/cm	0.27 mg/L	0.00 NTU	136.4 mV	5.19 ft	150.00 ml/min
6/28/2018 10:24 AM	06:00	6.65 pH	60.26 °F	634.38 µS/cm	0.93 mg/L	0.00 NTU	132.3 mV	5.19 ft	150.00 ml/min
6/28/2018 10:27 AM	09:00	6.68 pH	60.31 °F	589.32 µS/cm	2.09 mg/L	0.00 NTU	134.9 mV	5.19 ft	150.00 ml/min
6/28/2018 10:30 AM	12:00	6.70 pH	60.45 °F	546.70 µS/cm	3.01 mg/L	0.00 NTU	139.5 mV	5.19 ft	150.00 ml/min
6/28/2018 10:33 AM	15:00	6.71 pH	60.48 °F	526.45 µS/cm	3.43 mg/L	0.00 NTU	140.6 mV	5.19 ft	150.00 ml/min
6/28/2018 10:36 AM	18:00	6.72 pH	60.50 °F	513.91 µS/cm	3.72 mg/L	0.00 NTU	143.1 mV	5.19 ft	150.00 ml/min
6/28/2018 10:39 AM	21:00	6.72 pH	60.62 °F	505.07 µS/cm	3.92 mg/L	0.00 NTU	143.5 mV	5.19 ft	150.00 ml/min

**Samples**

Sample ID:	Description:
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# Low-Flow Test Report:

Test Date / Time: 6/28/2018 10:57:06 AM

Project: Edmonds Terminal 2Q18 (5)

Operator Name: AP

<b>Location Name: MW-515</b> <b>Well Diameter: 2 in</b> <b>Casing Type: PVC</b> <b>Screen Length: 10 m</b> <b>Top of Screen: 3 ft</b> <b>Total Depth: 13 ft</b> <b>Initial Depth to Water: 5.4 ft</b>	<b>Pump Type: Geotech geopump series 2</b> <b>Tubing Type: Polyethylene 0.170 x 1/4</b> <b>Pump Intake From TOC: 9 ft</b> <b>Estimated Total Volume Pumped: 4200 ml</b> <b>Flow Cell Volume: 130 ml</b> <b>Final Flow Rate: 200 ml/min</b> <b>Final Draw Down: 0 ft</b>	<b>Instrument Used: Aqua TROLL 600 Vented</b> <b>Serial Number: 457166</b>
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## Test Notes:

## Weather Conditions:

Cloudy, 63

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15 %		
6/28/2018 10:57 AM	00:00	6.83 pH	62.52 °F	1,049.3 µS/cm	0.43 mg/L	1.29 NTU	10.1 mV	5.40 ft	200.00 ml/min
6/28/2018 11:00 AM	03:00	6.82 pH	62.41 °F	1,001.0 µS/cm	0.20 mg/L	1.51 NTU	13.9 mV	5.40 ft	200.00 ml/min
6/28/2018 11:03 AM	06:00	6.82 pH	62.39 °F	961.21 µS/cm	0.16 mg/L	0.47 NTU	29.5 mV	5.40 ft	200.00 ml/min
6/28/2018 11:06 AM	09:00	6.82 pH	62.34 °F	914.81 µS/cm	0.11 mg/L	0.65 NTU	34.0 mV	5.40 ft	200.00 ml/min
6/28/2018 11:09 AM	12:00	6.82 pH	62.43 °F	897.98 µS/cm	0.12 mg/L	0.00 NTU	41.4 mV	5.40 ft	200.00 ml/min
6/28/2018 11:12 AM	15:00	6.81 pH	62.46 °F	883.65 µS/cm	0.10 mg/L	0.00 NTU	40.4 mV	5.40 ft	200.00 ml/min
6/28/2018 11:15 AM	18:00	6.81 pH	62.53 °F	877.51 µS/cm	0.11 mg/L	0.28 NTU	44.8 mV	5.40 ft	200.00 ml/min
6/28/2018 11:18 AM	21:00	6.81 pH	62.54 °F	862.02 µS/cm	0.11 mg/L	0.00 NTU	46.9 mV	5.40 ft	200.00 ml/min

## Samples

Sample ID:	Description:
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MW-515

Time: 1025  
Final RDO: 0.11  
Final DTW: 5.40  
Ferrous iron: 0.0

# Low-Flow Test Report:

Test Date / Time: 6/28/2018 12:06:42 PM

Project: Edmonds Terminal 2Q18 (6)

Operator Name: AP

<b>Location Name: MW-516</b> <b>Well Diameter: 2 in</b> <b>Casing Type: PVC</b> <b>Screen Length: 10 ft</b> <b>Top of Screen: 3 ft</b> <b>Total Depth: 13 ft</b> <b>Initial Depth to Water: 5.04 ft</b>	<b>Pump Type: Geotech geopump series 2</b> <b>Tubing Type: Polyethylene 0.170 x 1/4</b> <b>Pump Intake From TOC: 9 ft</b> <b>Estimated Total Volume Pumped: 1200 ml</b> <b>Flow Cell Volume: 130 ml</b> <b>Final Flow Rate: 200 ml/min</b> <b>Final Draw Down: 0 ft</b>	<b>Instrument Used: Aqua TROLL 600 Vented</b> <b>Serial Number: 457166</b>
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## Test Notes:

## Weather Conditions:

Cloudy, 63

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15 %		
6/28/2018 12:06 PM	00:00	6.71 pH	65.46 °F	703.64 µS/cm	0.78 mg/L	0.00 NTU	112.0 mV	5.04 ft	200.00 ml/min
6/28/2018 12:09 PM	03:00	6.70 pH	64.67 °F	708.01 µS/cm	0.76 mg/L	0.00 NTU	100.4 mV	5.04 ft	200.00 ml/min
6/28/2018 12:12 PM	06:00	6.70 pH	64.49 °F	719.44 µS/cm	0.56 mg/L	0.00 NTU	98.5 mV	5.04 ft	200.00 ml/min

## Samples

Sample ID:	Description:
MW-516	Sample time: 1120 Final DTW: 5.04 Ferrous iron: 0.0



# Low-Flow Test Report:

Test Date / Time: 6/28/2018 1:08:01 PM

Project: Edmonds Terminal 2Q18

Operator Name: EK

<b>Location Name: MW-517</b> <b>Well Diameter: 2 in</b> <b>Casing Type: PVC</b> <b>Screen Length: 10 ft</b> <b>Top of Screen: 3 ft</b> <b>Total Depth: 13 ft</b> <b>Initial Depth to Water: 5.9 ft</b>	<b>Pump Type: Geotech geopump series 2</b> <b>Tubing Type: Polyethylene 0.170" x 1/4"</b> <b>Pump Intake From TOC: 8 ft</b> <b>Estimated Total Volume Pumped: 3600 ml</b> <b>Flow Cell Volume: 130 ml</b> <b>Final Flow Rate: 200 ml/min</b> <b>Final Draw Down: 0 ft</b>	<b>Instrument Used: Aqua TROLL 600 Vented</b> <b>Serial Number: 466586</b>
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## Test Notes:

## Weather Conditions:

70 and cloudy

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15 %		
6/28/2018 1:08 PM	00:00	6.83 pH	63.14 °F	449.32 µS/cm	2.87 mg/L	6.08 NTU	112.9 mV	5.90 ft	200.00 ml/min
6/28/2018 1:11 PM	03:00	6.87 pH	63.15 °F	477.49 µS/cm	2.92 mg/L	4.89 NTU	97.9 mV	5.90 ft	200.00 ml/min
6/28/2018 1:14 PM	06:00	6.85 pH	63.28 °F	493.37 µS/cm	2.65 mg/L	0.30 NTU	94.1 mV	5.90 ft	200.00 ml/min
6/28/2018 1:17 PM	09:00	6.84 pH	63.32 °F	497.70 µS/cm	2.07 mg/L	0.00 NTU	91.7 mV	5.90 ft	200.00 ml/min
6/28/2018 1:20 PM	12:00	6.83 pH	63.35 °F	496.11 µS/cm	1.77 mg/L	0.00 NTU	90.3 mV	5.90 ft	200.00 ml/min
6/28/2018 1:23 PM	15:00	6.83 pH	63.37 °F	492.00 µS/cm	1.69 mg/L	0.00 NTU	89.0 mV	5.90 ft	200.00 ml/min
6/28/2018 1:26 PM	18:00	6.82 pH	63.39 °F	493.84 µS/cm	1.71 mg/L	0.00 NTU	89.0 mV	5.90 ft	200.00 ml/min

## Samples

Sample ID:	Description:
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MW-517	Sample time 1235 Final DTW 5.90 ft btoc Final RDO 1.71 mg/L Ferrous iron 0.0 mg/L
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Created using VuSitu from In-Situ, Inc.

# Low-Flow Test Report:

**Test Date / Time:** 6/27/2018 2:53:35 PM

**Project:** Edmonds Terminal (2) (2) (2)

**Operator Name:** Jason Little

<p><b>Location Name: Mw-519</b>  <b>Well Diameter: 2 in</b>  <b>Casing Type: Pvc</b>  <b>Screen Length: 10 ft</b>  <b>Top of Screen: 3 ft</b>  <b>Total Depth: 13 ft</b>  <b>Initial Depth to Water: 7.33 ft</b></p>	<p><b>Pump Type: Geotech pump series 2</b>  <b>Tubing Type: Polyethylene 0.170" x 1/4</b>  <b>Pump Intake From TOC: 9.5 ft</b>  <b>Estimated Total Volume Pumped: 3150 ml</b>  <b>Flow Cell Volume: 130 ml</b>  <b>Final Flow Rate: 150 ml/min</b>  <b>Final Draw Down: 0 ft</b></p>	<p><b>Instrument Used: Aqua TROLL 600 Vented</b>  <b>Serial Number: 466472</b></p>
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**Test Notes:**

**Weather Conditions:**

68 over cast

**Low-Flow Readings:**

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15		
6/27/2018 2:53 PM	00:00	6.71 pH	64.95 °F	497.55 µS/cm	1.71 mg/L	253.57 NTU	-19.3 mV	7.33 ft	150.00 ml/min
6/27/2018 2:56 PM	03:00	6.64 pH	64.50 °F	489.76 µS/cm	0.39 mg/L	0.00 NTU	-0.1 mV	7.33 ft	150.00 ml/min
6/27/2018 2:59 PM	06:00	6.64 pH	64.51 °F	488.33 µS/cm	0.36 mg/L	0.00 NTU	3.9 mV	7.33 ft	150.00 ml/min
6/27/2018 3:02 PM	09:00	6.64 pH	64.48 °F	483.21 µS/cm	0.57 mg/L	0.00 NTU	7.1 mV	7.33 ft	150.00 ml/min
6/27/2018 3:05 PM	12:00	6.65 pH	64.43 °F	484.48 µS/cm	0.78 mg/L	0.00 NTU	8.5 mV	7.33 ft	150.00 ml/min
6/27/2018 3:08 PM	15:00	6.64 pH	64.35 °F	482.46 µS/cm	0.92 mg/L	0.00 NTU	9.3 mV	7.33 ft	150.00 ml/min
6/27/2018 3:11 PM	18:00	6.65 pH	64.42 °F	483.55 µS/cm	0.95 mg/L	0.00 NTU	9.1 mV	7.33 ft	150.00 ml/min
6/27/2018 3:14 PM	21:00	6.65 pH	64.38 °F	479.94 µS/cm	0.98 mg/L	0.00 NTU	9.6 mV	7.33 ft	150.00 ml/min

**Samples**

Sample ID:	Description:
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Mw-519	Sample time-1420 ldtw- 7.35 Fdtw-7.33 Ferrous iron- 1.0 mg/l
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Created using VuSitu from In-Situ, Inc.

# Low-Flow Test Report:

Test Date / Time: 6/28/2018 11:55:13 AM

Project: Edmonds Terminal (2) (2) (2) (2) (2) (2) (2)

Operator Name: Jason Little

<b>Location Name: Mw-520</b> <b>Well Diameter: 2 in</b> <b>Casing Type: Pvc</b> <b>Screen Length: 10 ft</b> <b>Top of Screen: 3 ft</b> <b>Total Depth: 13 ft</b> <b>Initial Depth to Water: 7.92 ft</b>	<b>Pump Type: Geotech pump series 2</b> <b>Tubing Type: Polyethylene 0.170" x 1/4</b> <b>Pump Intake From TOC: 10 ft</b> <b>Estimated Total Volume Pumped: 2700 ml</b> <b>Flow Cell Volume: 130 ml</b> <b>Final Flow Rate: 150 ml/min</b> <b>Final Draw Down: 0.01 ft</b>	<b>Instrument Used: Aqua TROLL 600 Vented</b> <b>Serial Number: 466472</b>
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## Test Notes:

## Weather Conditions:

64 overcast

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15		
6/28/2018 11:55 AM	00:00	6.88 pH	60.56 °F	720.26 µS/cm	1.24 mg/L	0.00 NTU	-27.5 mV	7.92 ft	150.00 ml/min
6/28/2018 11:58 AM	03:00	6.86 pH	60.95 °F	672.81 µS/cm	0.43 mg/L	0.00 NTU	-8.2 mV	7.92 ft	150.00 ml/min
6/28/2018 12:01 PM	06:00	6.87 pH	60.67 °F	604.38 µS/cm	0.16 mg/L	0.00 NTU	0.5 mV	7.92 ft	150.00 ml/min
6/28/2018 12:04 PM	09:00	6.87 pH	60.73 °F	583.29 µS/cm	0.12 mg/L	0.00 NTU	6.8 mV	7.92 ft	150.00 ml/min
6/28/2018 12:07 PM	12:00	6.87 pH	60.83 °F	577.09 µS/cm	0.11 mg/L	0.00 NTU	11.7 mV	7.92 ft	150.00 ml/min
6/28/2018 12:10 PM	15:00	6.86 pH	60.89 °F	570.79 µS/cm	0.11 mg/L	0.00 NTU	14.8 mV	7.92 ft	150.00 ml/min
6/28/2018 12:13 PM	18:00	6.87 pH	60.89 °F	573.88 µS/cm	0.13 mg/L	0.00 NTU	14.8 mV	7.92 ft	150.00 ml/min

## Samples

Sample ID:	Description:
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Mw-520	Sample time-1130 ldtw-7.92 Final dtw -7.93 Final rdo o.13 mg/l Ferrous iron -0.0
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# Low-Flow Test Report:

Test Date / Time: 6/28/2018 1:08:32 PM

Project: Edmonds Terminal (2) (2) (2) (2) (2) (2) (2) (2)

Operator Name: Jason Little

<b>Location Name: Mw-521</b> <b>Well Diameter: 2 in</b> <b>Casing Type: Pvc</b> <b>Screen Length: 10 ft</b> <b>Top of Screen: 3 ft</b> <b>Total Depth: 13 ft</b> <b>Initial Depth to Water: 6.85 ft</b>	<b>Pump Type: Geotech pump series 2</b> <b>Tubing Type: Polyethylene 0.170" x 1/4</b> <b>Pump Intake From TOC: 9.5 ft</b> <b>Estimated Total Volume Pumped: 1350 ml</b> <b>Flow Cell Volume: 130 ml</b> <b>Final Flow Rate: 150 ml/min</b> <b>Final Draw Down: 0.05 ft</b>	<b>Instrument Used: Aqua TROLL 600 Vented</b> <b>Serial Number: 466472</b>
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## Test Notes:

## Weather Conditions:

65 overcast

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15		
6/28/2018 1:08 PM	00:00	6.68 pH	64.37 °F	554.18 µS/cm	1.85 mg/L	0.00 NTU	134.1 mV	6.85 ft	150.00 ml/min
6/28/2018 1:11 PM	03:00	6.69 pH	63.51 °F	574.40 µS/cm	0.80 mg/L	0.00 NTU	128.2 mV	6.85 ft	150.00 ml/min
6/28/2018 1:14 PM	06:00	6.69 pH	63.18 °F	566.52 µS/cm	0.84 mg/L	0.00 NTU	127.0 mV	6.85 ft	150.00 ml/min
6/28/2018 1:17 PM	09:00	6.70 pH	62.98 °F	574.72 µS/cm	0.74 mg/L	0.00 NTU	123.8 mV	6.85 ft	150.00 ml/min

## Samples

Sample ID:	Description:
Mw-521	Sample -1230 Ferrous iron-0.0 ldtw-6.85 ldtw-6.90 Frdo-0.0

# Low-Flow Test Report:

**Test Date / Time:** 6/27/2018 9:32:17 AM

**Project:** Edmonds Terminal 2Q18

**Operator Name:** PRMC

<p><b>Location Name: MW-525</b>  <b>Well Diameter: 2 in</b>  <b>Casing Type: PVC</b>  <b>Screen Length: 13 ft</b>  <b>Top of Screen: 3 ft</b>  <b>Initial Depth to Water: 6.69 ft</b></p>	<p><b>Pump Type: Geotech Geopump Series 2</b>  <b>Tubing Type: Polyethylene 0.170" x .25"</b>  <b>Estimated Total Volume Pumped: 6750 ml</b>  <b>Flow Cell Volume: 130 ml</b>  <b>Final Flow Rate: 150 ml/min</b>  <b>Final Draw Down: 0.28 ft</b></p>	<p><b>Instrument Used: Aqua TROLL 600 Vented</b>  <b>Serial Number: 466689</b></p>
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**Test Notes:**

**Weather Conditions:**

Overcast, cool

**Low-Flow Readings:**

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15 %		
6/27/2018 9:32 AM	00:00	4.12 pH	68.74 °F	1,650.9 µS/cm	2.51 mg/L	1,777.2 NTU	243.5 mV	6.69 ft	150.00 ml/min
6/27/2018 9:35 AM	03:00	3.89 pH	63.88 °F	1,705.3 µS/cm	0.37 mg/L	716.18 NTU	264.5 mV	6.69 ft	150.00 ml/min
6/27/2018 9:38 AM	06:00	3.97 pH	63.26 °F	1,685.3 µS/cm	0.26 mg/L	90.28 NTU	265.6 mV	6.69 ft	150.00 ml/min
6/27/2018 9:41 AM	09:00	4.37 pH	63.30 °F	1,392.7 µS/cm	0.20 mg/L	109.87 NTU	80.1 mV	6.69 ft	150.00 ml/min
6/27/2018 9:44 AM	12:00	4.60 pH	63.11 °F	1,256.0 µS/cm	0.17 mg/L	57.22 NTU	-81.7 mV	6.69 ft	150.00 ml/min
6/27/2018 9:47 AM	15:00	4.72 pH	63.11 °F	1,189.5 µS/cm	0.15 mg/L	36.74 NTU	-119.4 mV	6.69 ft	150.00 ml/min
6/27/2018 9:50 AM	18:00	4.80 pH	63.06 °F	1,138.1 µS/cm	0.13 mg/L	20.04 NTU	-151.7 mV	6.69 ft	150.00 ml/min
6/27/2018 9:53 AM	21:00	4.84 pH	63.06 °F	1,106.3 µS/cm	0.10 mg/L	29.62 NTU	-197.9 mV	6.69 ft	150.00 ml/min
6/27/2018 9:56 AM	24:00	4.88 pH	62.94 °F	1,086.7 µS/cm	0.07 mg/L	17.02 NTU	-208.3 mV	6.69 ft	150.00 ml/min
6/27/2018 9:59 AM	27:00	5.04 pH	62.92 °F	1,075.7 µS/cm	0.07 mg/L	38.73 NTU	-230.9 mV	6.69 ft	150.00 ml/min
6/27/2018 10:02 AM	30:00	5.18 pH	63.20 °F	1,036.4 µS/cm	0.05 mg/L	17.17 NTU	-245.8 mV	6.69 ft	150.00 ml/min
6/27/2018 10:05 AM	33:00	5.23 pH	63.15 °F	1,040.3 µS/cm	0.08 mg/L	14.91 NTU	-256.1 mV	6.69 ft	150.00 ml/min
6/27/2018 10:08 AM	36:00	5.28 pH	63.07 °F	1,033.2 µS/cm	0.04 mg/L	16.47 NTU	-263.6 mV	6.69 ft	150.00 ml/min



6/27/2018 10:11 AM	39:00	5.31 pH	63.24 °F	1,028.0 µS/cm	0.03 mg/L	18.66 NTU	-263.2 mV	6.69 ft	150.00 ml/min
6/27/2018 10:14 AM	42:00	5.39 pH	63.42 °F	1,017.8 µS/cm	0.02 mg/L	19.19 NTU	-261.4 mV	6.69 ft	150.00 ml/min
6/27/2018 10:17 AM	45:00	5.43 pH	63.42 °F	1,013.2 µS/cm	0.02 mg/L	20.20 NTU	-266.6 mV	6.69 ft	150.00 ml/min

## Samples

Sample ID:	Description:
MW-525	Sample Time 0920 Iron 5.0

# Low-Flow Test Report:

Test Date / Time: 6/27/2018 9:08:49 AM

Project: Edmonds Terminal 2Q18

Operator Name: EK

<b>Location Name: MW-526</b> <b>Well Diameter: 2 in</b> <b>Casing Type: PVC</b> <b>Screen Length: 10 ft</b> <b>Top of Screen: 3 ft</b> <b>Total Depth: 13 ft</b> <b>Initial Depth to Water: 6.14 ft</b>	<b>Pump Type: Geotech geopump series 2</b> <b>Tubing Type: Polyethylene 0.170" x 1/4"</b> <b>Pump Intake From TOC: 9 ft</b> <b>Estimated Total Volume Pumped: 9000 ml</b> <b>Flow Cell Volume: 130 ml</b> <b>Final Flow Rate: 200 ml/min</b> <b>Final Draw Down: 0.4 ft</b>	<b>Instrument Used: Aqua TROLL 600 Vented</b> <b>Serial Number: 466586</b>
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## Test Notes:

## Weather Conditions:

65 and sunny

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15 %		
6/27/2018 9:08 AM	00:00	6.80 pH	59.59 °F	540.64 µS/cm	0.51 mg/L	370.78 NTU	28.1 mV	6.14 ft	200.00 ml/min
6/27/2018 9:11 AM	03:00	6.81 pH	59.91 °F	537.45 µS/cm	0.55 mg/L	353.32 NTU	32.2 mV	6.14 ft	200.00 ml/min
6/27/2018 9:14 AM	06:00	6.81 pH	60.10 °F	539.90 µS/cm	0.54 mg/L	360.18 NTU	23.3 mV	6.14 ft	200.00 ml/min
6/27/2018 9:17 AM	09:00	6.82 pH	60.31 °F	533.82 µS/cm	0.55 mg/L	421.08 NTU	10.4 mV	6.14 ft	200.00 ml/min
6/27/2018 9:20 AM	12:00	6.83 pH	60.58 °F	530.60 µS/cm	0.61 mg/L	445.60 NTU	4.7 mV	6.14 ft	200.00 ml/min
6/27/2018 9:23 AM	15:00	6.83 pH	60.50 °F	528.79 µS/cm	0.62 mg/L	443.85 NTU	0.9 mV	6.14 ft	200.00 ml/min
6/27/2018 9:26 AM	18:00	6.83 pH	60.55 °F	527.77 µS/cm	0.61 mg/L	451.07 NTU	-5.4 mV	6.14 ft	200.00 ml/min
6/27/2018 9:29 AM	21:00	6.83 pH	60.62 °F	526.24 µS/cm	0.59 mg/L	469.28 NTU	-12.1 mV	6.14 ft	200.00 ml/min
6/27/2018 9:32 AM	24:00	6.83 pH	60.68 °F	526.87 µS/cm	0.57 mg/L	499.94 NTU	-23.9 mV	6.14 ft	200.00 ml/min
6/27/2018 9:35 AM	27:00	6.82 pH	60.67 °F	528.97 µS/cm	0.53 mg/L	523.15 NTU	-36.8 mV	6.14 ft	200.00 ml/min
6/27/2018 9:38 AM	30:00	6.82 pH	60.75 °F	535.48 µS/cm	0.48 mg/L	530.22 NTU	-50.9 mV	6.14 ft	200.00 ml/min
6/27/2018 9:41 AM	33:00	6.81 pH	60.70 °F	539.52 µS/cm	0.43 mg/L	530.07 NTU	-61.7 mV	6.14 ft	200.00 ml/min

6/27/2018 9:44 AM	36:00	6.80 pH	60.67 °F	548.93 µS/cm	0.39 mg/L	527.09 NTU	-72.1 mV	6.14 ft	200.00 ml/min
6/27/2018 9:47 AM	39:00	6.80 pH	60.63 °F	557.41 µS/cm	0.36 mg/L	519.14 NTU	-81.3 mV	6.14 ft	200.00 ml/min
6/27/2018 9:50 AM	42:00	6.79 pH	60.65 °F	564.33 µS/cm	0.32 mg/L	510.91 NTU	-90.6 mV	6.14 ft	200.00 ml/min
6/27/2018 9:53 AM	45:00	6.78 pH	60.72 °F	567.73 µS/cm	0.29 mg/L	508.94 NTU	-97.9 mV	6.14 ft	200.00 ml/min

## Samples

Sample ID:	Description:
MW-526	Sample time 0900 Final DTW 6.54 ft btoc Final RDO 0.29 mg/L Ferrous Iron 5.0 mg/L

# Low-Flow Test Report:

Test Date / Time: 6/27/2018 9:40:16 AM

Project: Edmonds Terminal

Operator Name: Jason Little

<b>Location Name: Mw-531</b> <b>Well Diameter: 2 in</b> <b>Casing Type: Pvc</b> <b>Screen Length: 10 ft</b> <b>Top of Screen: 3 ft</b> <b>Total Depth: 13 ft</b> <b>Initial Depth to Water: 7.9 m</b>	<b>Pump Type: Geotech pump series 2</b> <b>Tubing Type: Polyethylene 0.170"</b> <b>x 1/4</b> <b>Pump Intake From TOC: 10 ft</b> <b>Estimated Total Volume Pumped:</b> <b>5870 ml</b> <b>Flow Cell Volume: 130 ml</b> <b>Final Flow Rate: 150 ml/min</b> <b>Final Draw Down: 0.01 ft</b>	<b>Instrument Used: Aqua TROLL 600</b> <b>Vented</b> <b>Serial Number: 466472</b>
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## Test Notes:

## Weather Conditions:

68 sunny

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15		
6/27/2018 9:40 AM	00:00	6.66 pH	59.27 °F	487.96 µS/cm	1.14 mg/L	566.98 NTU	-16.6 mV	7.90 m	150.00 ml/min
6/27/2018 9:43 AM	03:00	6.66 pH	59.30 °F	470.20 µS/cm	0.97 mg/L	211.68 NTU	8.6 mV	7.90 m	150.00 ml/min
6/27/2018 9:46 AM	06:00	6.65 pH	59.34 °F	463.28 µS/cm	1.34 mg/L	105.00 NTU	14.8 mV	7.90 m	150.00 ml/min
6/27/2018 9:49 AM	09:00	6.66 pH	59.48 °F	459.74 µS/cm	1.53 mg/L	232.56 NTU	14.3 mV	7.90 m	150.00 ml/min
6/27/2018 9:52 AM	12:00	6.67 pH	59.56 °F	454.06 µS/cm	1.11 mg/L	16.93 NTU	14.3 mV	7.90 m	150.00 ml/min
6/27/2018 9:55 AM	15:00	6.64 pH	59.80 °F	453.91 µS/cm	0.54 mg/L	3.97 NTU	9.7 mV	7.90 m	150.00 ml/min
6/27/2018 9:58 AM	18:00	6.64 pH	60.04 °F	461.59 µS/cm	0.49 mg/L	7.17 NTU	11.8 mV	7.90 m	150.00 ml/min
6/27/2018 10:01 AM	21:00	6.63 pH	60.29 °F	465.13 µS/cm	0.55 mg/L	21.75 NTU	13.8 mV	7.90 m	150.00 ml/min
6/27/2018 10:04 AM	24:08	6.63 pH	60.32 °F	473.25 µS/cm	0.79 mg/L	0.00 NTU	13.3 mV	7.90 m	150.00 ml/min
6/27/2018 10:07 AM	27:08	6.63 pH	60.21 °F	473.49 µS/cm	0.91 mg/L	0.00 NTU	17.3 mV	7.90 m	150.00 ml/min
6/27/2018 10:10 AM	30:08	6.62 pH	60.24 °F	473.87 µS/cm	1.10 mg/L	0.58 NTU	21.4 mV	7.90 m	150.00 ml/min
6/27/2018 10:13 AM	33:08	6.63 pH	60.22 °F	477.82 µS/cm	1.33 mg/L	0.00 NTU	24.1 mV	7.90 m	150.00 ml/min

6/27/2018 10:16 AM	36:08	6.62 pH	60.30 °F	481.29 µS/cm	1.48 mg/L	0.71 NTU	26.6 mV	7.90 m	150.00 ml/min
6/27/2018 10:19 AM	39:08	6.63 pH	60.25 °F	490.45 µS/cm	1.54 mg/L	0.00 NTU	28.8 mV	7.90 m	150.00 ml/min

## Samples

Sample ID:	Description:
MW-531	Sample time-0930 Final rdo-1.54 mg/l ldtw-7.90 Final dtw-7.91 Fe iron- 0 mg/l

# Low-Flow Test Report:

Test Date / Time: 6/27/2018 10:00:18 AM

Project: Edmonds Terminal 2Q18

Operator Name: AP

<b>Location Name: MW-532</b> <b>Well Diameter: 2 in</b> <b>Casing Type: PVC</b> <b>Screen Length: 10 ft</b> <b>Top of Screen: 3 ft</b> <b>Total Depth: 13 ft</b> <b>Initial Depth to Water: 7.58 ft</b>	<b>Pump Type: Geotech geopump series 2</b> <b>Tubing Type: Polyethylene 0.170 x 1/4</b> <b>Pump Intake From TOC: 9 ft</b> <b>Estimated Total Volume Pumped: 7200 ml</b> <b>Flow Cell Volume: 130 ml</b> <b>Final Flow Rate: 200 ml/min</b> <b>Final Draw Down: 1.25 ft</b>	<b>Instrument Used: Aqua TROLL 600 Vented</b> <b>Serial Number: 457166</b>
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## Test Notes:

## Weather Conditions:

Sunny, 65°

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15 %		
6/27/2018 10:00 AM	00:00	5.69 pH	59.51 °F	453.31 µS/cm	0.06 mg/L	14.37 NTU	59.7 mV	7.58 ft	200.00 ml/min
6/27/2018 10:03 AM	03:00	5.72 pH	58.93 °F	457.16 µS/cm	0.03 mg/L	1.74 NTU	14.2 mV	7.58 ft	200.00 ml/min
6/27/2018 10:06 AM	06:00	5.64 pH	58.99 °F	455.28 µS/cm	0.09 mg/L	10.25 NTU	-30.2 mV	7.58 ft	200.00 ml/min
6/27/2018 10:09 AM	09:00	5.63 pH	58.81 °F	458.05 µS/cm	0.11 mg/L	6.61 NTU	-42.4 mV	7.58 ft	200.00 ml/min
6/27/2018 10:12 AM	12:00	5.64 pH	58.68 °F	458.51 µS/cm	0.13 mg/L	2.19 NTU	-44.8 mV	7.58 ft	200.00 ml/min
6/27/2018 10:15 AM	15:00	5.65 pH	58.47 °F	457.53 µS/cm	0.12 mg/L	5.77 NTU	-55.2 mV	7.58 ft	200.00 ml/min
6/27/2018 10:18 AM	18:00	5.65 pH	58.49 °F	458.71 µS/cm	0.10 mg/L	1.10 NTU	-63.8 mV	7.58 ft	200.00 ml/min
6/27/2018 10:21 AM	21:00	5.67 pH	58.30 °F	462.31 µS/cm	0.09 mg/L	0.52 NTU	-64.1 mV	7.58 ft	200.00 ml/min
6/27/2018 10:24 AM	24:00	5.68 pH	58.35 °F	461.50 µS/cm	0.08 mg/L	0.41 NTU	-63.0 mV	7.58 ft	200.00 ml/min
6/27/2018 10:27 AM	27:00	5.71 pH	58.20 °F	453.50 µS/cm	0.07 mg/L	1.04 NTU	-58.5 mV	7.58 ft	200.00 ml/min
6/27/2018 10:30 AM	30:00	5.71 pH	58.28 °F	446.75 µS/cm	0.07 mg/L	0.05 NTU	-47.6 mV	7.58 ft	200.00 ml/min
6/27/2018 10:33 AM	33:00	5.71 pH	58.20 °F	461.52 µS/cm	0.07 mg/L	0.08 NTU	-44.4 mV	7.58 ft	200.00 ml/min

6/27/2018 10:36 AM	36:00	5.74 pH	58.24 °F	450.76 µS/cm	0.07 mg/L	0.12 NTU	-44.0 mV	7.58 ft	200.00 ml/min
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## Samples

Sample ID:	Description:
MW-532	Sample time: 0945 Final RDO: 0.07 Final DTW: 8.83 Ferrous Iron: 0.5

# Low-Flow Test Report:

Test Date / Time: 6/27/2018 1:44:07 PM

Project: Edmonds Terminal 2Q18

Operator Name: EK

<p><b>Location Name: MW-534</b>  <b>Well Diameter: 2 in</b>  <b>Casing Type: PVC</b>  <b>Screen Length: 10 ft</b>  <b>Top of Screen: 3 ft</b>  <b>Total Depth: 13 ft</b>  <b>Initial Depth to Water: 4.05 ft</b></p>	<p><b>Pump Type: Geotech geopump series 2</b>  <b>Tubing Type: Polyethylene 0.170" x 1/4"</b>  <b>Pump Intake From TOC: 8 ft</b>  <b>Estimated Total Volume Pumped: 4800 ml</b>  <b>Flow Cell Volume: 130 ml</b>  <b>Final Flow Rate: 200 ml/min</b>  <b>Final Draw Down: 0.2 ft</b></p>	<p><b>Instrument Used: Aqua TROLL 600 Vented</b>  <b>Serial Number: 466586</b></p>
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## Test Notes:

## Weather Conditions:

Sunny and 70

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15 %		
6/27/2018 1:44 PM	00:00	6.66 pH	63.92 °F	2,381.8 µS/cm	1.51 mg/L	27.38 NTU	-75.2 mV	4.05 ft	200.00 ml/min
6/27/2018 1:47 PM	03:00	6.67 pH	63.50 °F	2,264.3 µS/cm	0.31 mg/L	61.32 NTU	-100.4 mV	4.05 ft	200.00 ml/min
6/27/2018 1:50 PM	06:00	6.67 pH	63.33 °F	2,280.5 µS/cm	0.21 mg/L	36.88 NTU	-117.0 mV	4.05 ft	200.00 ml/min
6/27/2018 1:53 PM	09:00	6.67 pH	63.23 °F	2,294.1 µS/cm	0.18 mg/L	28.65 NTU	-137.9 mV	4.05 ft	200.00 ml/min
6/27/2018 1:56 PM	12:00	6.66 pH	63.26 °F	2,341.0 µS/cm	0.20 mg/L	20.96 NTU	-156.6 mV	4.05 ft	200.00 ml/min
6/27/2018 1:59 PM	15:00	6.66 pH	63.25 °F	2,375.9 µS/cm	0.18 mg/L	14.55 NTU	-167.7 mV	4.05 ft	200.00 ml/min
6/27/2018 2:02 PM	18:00	6.66 pH	63.22 °F	2,394.6 µS/cm	0.17 mg/L	7.95 NTU	-174.9 mV	4.05 ft	200.00 ml/min
6/27/2018 2:05 PM	21:00	6.66 pH	63.17 °F	2,412.3 µS/cm	0.16 mg/L	10.09 NTU	-180.1 mV	4.05 ft	200.00 ml/min
6/27/2018 2:08 PM	24:00	6.66 pH	63.17 °F	2,453.1 µS/cm	0.15 mg/L	5.34 NTU	-184.2 mV	4.05 ft	200.00 ml/min

## Samples

Sample ID:	Description:
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MW-534	Sample time 1310 Final DTW 4.25 ft btoc Final RDO 0.15 mg/L Ferrous iron 6.0 mg/L
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# Low-Flow Test Report:

Test Date / Time: 6/27/2018 1:10:18 PM

Project: Edmonds Terminal (2) (2)

Operator Name: Jason Little

<b>Location Name: MW-E-R</b> <b>Well Diameter: 2 in</b> <b>Casing Type: Pvc</b> <b>Screen Length: 10 ft</b> <b>Top of Screen: 3 ft</b> <b>Total Depth: 13 ft</b> <b>Initial Depth to Water: 7.34 ft</b>	<b>Pump Type: Geotech pump series 2</b> <b>Tubing Type: Polyethylene 0.170"</b> <b>x 1/4</b> <b>Pump Intake From TOC: 9.5 ft</b> <b>Estimated Total Volume Pumped:</b> <b>6750 ml</b> <b>Flow Cell Volume: 130 ml</b> <b>Final Flow Rate: 150 ml/min</b> <b>Final Draw Down: 0.79 ft</b>	<b>Instrument Used: Aqua TROLL 600</b> <b>Vented</b> <b>Serial Number: 466472</b>
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## Test Notes:

Sample time-1300

ldtw-7.34

fdtw-8.13

Final rdo-0.00

Ferrous iron-4.5 mg/l

## Weather Conditions:

66 degrees overcast

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15		
6/27/2018 1:10 PM	00:00	6.53 pH	64.48 °F	1,564.4 µS/cm	0.36 mg/L	3.75 NTU	-102.5 mV	7.34 ft	150.00 ml/min
6/27/2018 1:13 PM	03:00	6.54 pH	62.02 °F	1,614.8 µS/cm	0.12 mg/L	29.90 NTU	-128.4 mV	7.34 ft	150.00 ml/min
6/27/2018 1:16 PM	06:00	6.53 pH	61.73 °F	1,597.1 µS/cm	0.07 mg/L	16.91 NTU	-131.3 mV	7.34 ft	150.00 ml/min
6/27/2018 1:19 PM	09:00	6.54 pH	61.43 °F	1,617.2 µS/cm	0.07 mg/L	3.11 NTU	-126.4 mV	7.34 ft	150.00 ml/min
6/27/2018 1:22 PM	12:00	6.55 pH	61.09 °F	1,631.0 µS/cm	0.05 mg/L	2.91 NTU	-134.7 mV	7.34 ft	150.00 ml/min
6/27/2018 1:25 PM	15:00	6.56 pH	60.80 °F	1,632.5 µS/cm	0.04 mg/L	0.81 NTU	-138.1 mV	7.34 ft	150.00 ml/min
6/27/2018 1:28 PM	18:00	6.56 pH	60.65 °F	1,669.2 µS/cm	0.13 mg/L	5.07 NTU	-126.8 mV	7.34 ft	150.00 ml/min
6/27/2018 1:31 PM	21:00	6.56 pH	60.56 °F	1,657.7 µS/cm	0.06 mg/L	0.00 NTU	-107.7 mV	7.34 ft	150.00 ml/min
6/27/2018 1:34 PM	24:00	6.57 pH	60.39 °F	1,673.9 µS/cm	0.12 mg/L	0.95 NTU	-124.1 mV	7.34 ft	150.00 ml/min

6/27/2018 1:37 PM	27:00	6.57 pH	60.22 °F	1,674.4 µS/cm	0.02 mg/L	0.00 NTU	-136.9 mV	7.34 ft	150.00 ml/min
6/27/2018 1:40 PM	30:00	6.57 pH	60.09 °F	1,680.4 µS/cm	0.01 mg/L	0.00 NTU	-138.4 mV	7.34 ft	150.00 ml/min
6/27/2018 1:43 PM	33:00	6.58 pH	59.87 °F	1,682.5 µS/cm	0.01 mg/L	0.00 NTU	-143.7 mV	7.34 ft	150.00 ml/min
6/27/2018 1:46 PM	36:00	6.58 pH	59.79 °F	1,698.0 µS/cm	0.02 mg/L	0.00 NTU	-142.0 mV	7.34 ft	150.00 ml/min
6/27/2018 1:49 PM	39:00	6.58 pH	59.76 °F	1,698.7 µS/cm	0.01 mg/L	0.00 NTU	-136.8 mV	7.34 ft	150.00 ml/min
6/27/2018 1:52 PM	42:00	6.58 pH	59.58 °F	1,711.7 µS/cm	0.00 mg/L	0.00 NTU	-142.7 mV	7.34 ft	150.00 ml/min
6/27/2018 1:55 PM	45:00	6.58 pH	59.55 °F	1,704.6 µS/cm	0.00 mg/L	0.00 NTU	-144.3 mV	7.34 ft	150.00 ml/min

## Samples

Sample ID:	Description:
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# Low-Flow Test Report:

Test Date / Time: 9/20/2018 9:02:48 AM

Project: 3Q18 Edmonds Terminal

Operator Name: EK

<b>Location Name: LM-2</b> <b>Well Diameter: 2 in</b> <b>Casing Type: PVC</b> <b>Screen Length: 5.5 ft</b> <b>Top of Screen: 2.5 ft</b> <b>Total Depth: 8 ft</b> <b>Initial Depth to Water: 2.6 ft</b>	<b>Pump Type: Geotech geopump series 2</b> <b>Tubing Type: Polyethylene 0.170 x 1/4"</b> <b>Pump Intake From TOC: 5 ft</b> <b>Estimated Total Volume Pumped: 7200 ml</b> <b>Flow Cell Volume: 130 ml</b> <b>Final Flow Rate: 200 ml/min</b> <b>Final Draw Down: 0.02 ft</b>	<b>Instrument Used: Aqua TROLL 600 Vented</b> <b>Serial Number: 469050</b>
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## Test Notes:

## Weather Conditions:

55 and cloudy

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 15 %		
9/20/2018 9:02 AM	00:00	6.37 pH	60.71 °F	4,547.8 µS/cm	0.25 mg/L	-62.2 mV	2.60 ft	200.00 ml/min
9/20/2018 9:05 AM	03:00	6.38 pH	61.74 °F	4,524.7 µS/cm	0.14 mg/L	-74.7 mV	2.60 ft	200.00 ml/min
9/20/2018 9:08 AM	06:00	6.40 pH	62.00 °F	4,484.7 µS/cm	0.20 mg/L	-80.4 mV	2.60 ft	200.00 ml/min
9/20/2018 9:11 AM	09:00	6.40 pH	62.29 °F	4,463.2 µS/cm	0.09 mg/L	-84.1 mV	2.60 ft	200.00 ml/min
9/20/2018 9:14 AM	12:00	6.41 pH	62.45 °F	4,431.7 µS/cm	0.07 mg/L	-88.3 mV	2.60 ft	200.00 ml/min
9/20/2018 9:17 AM	15:00	6.42 pH	62.58 °F	4,383.2 µS/cm	0.06 mg/L	-91.8 mV	2.60 ft	200.00 ml/min
9/20/2018 9:20 AM	18:00	6.43 pH	62.63 °F	4,340.0 µS/cm	0.05 mg/L	-95.1 mV	2.60 ft	200.00 ml/min
9/20/2018 9:23 AM	21:00	6.44 pH	62.65 °F	4,303.7 µS/cm	0.05 mg/L	-98.5 mV	2.60 ft	200.00 ml/min
9/20/2018 9:26 AM	24:00	6.45 pH	62.68 °F	4,272.9 µS/cm	0.04 mg/L	-103.3 mV	2.60 ft	200.00 ml/min
9/20/2018 9:29 AM	27:00	6.46 pH	62.69 °F	4,238.7 µS/cm	0.04 mg/L	-106.8 mV	2.60 ft	200.00 ml/min
9/20/2018 9:32 AM	30:00	6.47 pH	62.66 °F	4,222.8 µS/cm	0.06 mg/L	-110.6 mV	2.60 ft	200.00 ml/min
9/20/2018 9:35 AM	33:00	6.48 pH	62.73 °F	4,198.3 µS/cm	0.05 mg/L	-114.8 mV	2.60 ft	200.00 ml/min

9/20/2018 9:38 AM	36:00	6.48 pH	62.72 °F	4,185.6 µS/cm	0.05 mg/L	-118.6 mV	2.60 ft	200.00 ml/min
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## Samples

Sample ID:	Description:
LM-2	Sample time 0845 Final DTW 2.80 ft btoc

# Low-Flow Test Report:

**Test Date / Time:** 9/18/2018 10:21:02 AM  
**Project:** Edmonds Terminal (2) (2) (2) (2) (2)  
**Operator Name:** JI

<b>Location Name: MW-8R</b> <b>Well Diameter: 2 in</b> <b>Casing Type: Pvc</b> <b>Screen Length: 10 ft</b> <b>Top of Screen: 3 ft</b> <b>Total Depth: 13 ft</b> <b>Initial Depth to Water: 8.38 ft</b>	<b>Pump Type: Geotecg geo pump series 2</b> <b>Tubing Type: Polyethylene 0.170" x 1/4"</b> <b>Pump Intake From TOC: 11 ft</b> <b>Estimated Total Volume Pumped: 2250 ml</b> <b>Flow Cell Volume: 130 ml</b> <b>Final Flow Rate: 150 ml/min</b> <b>Final Draw Down: 0 ft</b>	<b>Instrument Used: Aqua TROLL 600 Vented</b> <b>Serial Number: 457166</b>
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## Test Notes:

## Weather Conditions:

Overcast

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 15 %		
9/18/2018 10:21 AM	00:00	6.79 pH	60.59 °F	644.23 µS/cm	0.46 mg/L	148.1 mV	8.38 ft	150.00 ml/min
9/18/2018 10:24 AM	03:00	6.77 pH	61.00 °F	641.62 µS/cm	0.16 mg/L	110.7 mV	8.38 ft	150.00 ml/min
9/18/2018 10:27 AM	06:00	6.77 pH	61.07 °F	643.41 µS/cm	0.19 mg/L	109.5 mV	8.38 ft	150.00 ml/min
9/18/2018 10:30 AM	09:00	6.78 pH	61.16 °F	642.68 µS/cm	0.16 mg/L	93.2 mV	8.38 ft	150.00 ml/min
9/18/2018 10:33 AM	12:00	6.77 pH	61.20 °F	641.78 µS/cm	0.15 mg/L	91.7 mV	8.38 ft	150.00 ml/min
9/18/2018 10:36 AM	15:00	6.77 pH	61.21 °F	641.44 µS/cm	0.14 mg/L	82.6 mV	8.38 ft	150.00 ml/min

## Samples

Sample ID:	Description:
MW-8r	Sample time-0940 Fdtw-8.38

# Low-Flow Test Report:

**Test Date / Time:** 9/18/2018 12:50:18 PM

**Project:** Edmonds Terminal (2) (2) (2) (2) (2) (2) (2)

**Operator Name:** JI

<p><b>Location Name:</b> MW-20R  <b>Well Diameter:</b> 2 in  <b>Casing Type:</b> Pvc  <b>Screen Length:</b> 10 ft  <b>Top of Screen:</b> 4 ft  <b>Total Depth:</b> 14.5 ft  <b>Initial Depth to Water:</b> 6.74 ft</p>	<p><b>Pump Type:</b> Geotecg geo pump series 2  <b>Tubing Type:</b> Polyethylene 0.170" x 1/4"  <b>Pump Intake From TOC:</b> 11 ft  <b>Estimated Total Volume Pumped:</b> 3600 ml  <b>Flow Cell Volume:</b> 130 ml  <b>Final Flow Rate:</b> 150 ml/min  <b>Final Draw Down:</b> 0 ft</p>	<p><b>Instrument Used:</b> Aqua TROLL 600 Vented  <b>Serial Number:</b> 457166</p>
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## Test Notes:

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 15 %		
9/18/2018 12:50 PM	00:00	7.10 pH	61.17 °F	6,816.9 µS/cm	0.58 mg/L	-58.3 mV	6.74 ft	150.00 ml/min
9/18/2018 12:53 PM	03:00	7.24 pH	60.29 °F	7,228.3 µS/cm	0.14 mg/L	-117.1 mV	6.74 ft	150.00 ml/min
9/18/2018 12:56 PM	06:00	7.24 pH	59.97 °F	8,159.3 µS/cm	0.11 mg/L	-127.0 mV	6.74 ft	150.00 ml/min
9/18/2018 12:59 PM	09:00	7.23 pH	59.86 °F	8,338.5 µS/cm	0.08 mg/L	-130.9 mV	6.74 ft	150.00 ml/min
9/18/2018 1:02 PM	12:00	7.23 pH	59.72 °F	8,275.9 µS/cm	0.07 mg/L	-135.5 mV	6.74 ft	150.00 ml/min
9/18/2018 1:05 PM	15:00	7.22 pH	59.62 °F	8,485.1 µS/cm	0.06 mg/L	-139.7 mV	6.74 ft	150.00 ml/min
9/18/2018 1:08 PM	18:00	7.22 pH	59.55 °F	8,535.9 µS/cm	0.05 mg/L	-143.0 mV	6.74 ft	150.00 ml/min
9/18/2018 1:11 PM	21:00	7.22 pH	59.52 °F	8,559.8 µS/cm	0.05 mg/L	-144.4 mV	6.74 ft	150.00 ml/min
9/18/2018 1:14 PM	24:00	7.22 pH	59.56 °F	8,514.9 µS/cm	0.05 mg/L	-149.7 mV	6.74 ft	150.00 ml/min

## Samples

Sample ID:	Description:
NW-20R	Sample time-1220 Fdtw-6.73

# Low-Flow Test Report:

**Test Date / Time:** 9/18/2018 1:27:25 PM

**Project:** 3Q18 Edmonds Terminal

**Operator Name:** EK

<p><b>Location Name: MW-101</b>  <b>Well Diameter: 2 in</b>  <b>Casing Type: PVC</b>  <b>Screen Length: 10 ft</b>  <b>Top of Screen: 5 ft</b>  <b>Total Depth: 15 ft</b>  <b>Initial Depth to Water: 9.15 ft</b></p>	<p><b>Pump Type: Geotech geopump series 2</b>  <b>Tubing Type: Polyethylene 0.170 x 1/4"</b>  <b>Pump Intake From TOC: 12.5 ft</b>  <b>Estimated Total Volume Pumped: 6600 ml</b>  <b>Flow Cell Volume: 130 ml</b>  <b>Final Flow Rate: 200 ml/min</b>  <b>Final Draw Down: 0.03 ft</b></p>	<p><b>Instrument Used: Aqua TROLL 600 Vented</b>  <b>Serial Number: 469050</b></p>
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## Test Notes:

## Weather Conditions:

65 and sunny

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 15 %		
9/18/2018 1:27 PM	00:00	6.50 pH	66.56 °F	299.43 µS/cm	2.03 mg/L	72.0 mV	9.15 ft	200.00 ml/min
9/18/2018 1:30 PM	03:00	6.29 pH	65.25 °F	306.72 µS/cm	2.17 mg/L	79.3 mV	9.15 ft	200.00 ml/min
9/18/2018 1:33 PM	06:00	6.21 pH	64.21 °F	425.12 µS/cm	1.31 mg/L	66.8 mV	9.15 ft	200.00 ml/min
9/18/2018 1:36 PM	09:00	6.23 pH	63.78 °F	505.36 µS/cm	1.24 mg/L	54.9 mV	9.15 ft	200.00 ml/min
9/18/2018 1:39 PM	12:00	6.25 pH	63.56 °F	510.15 µS/cm	1.25 mg/L	49.5 mV	9.15 ft	200.00 ml/min
9/18/2018 1:42 PM	15:00	6.25 pH	63.35 °F	614.01 µS/cm	1.11 mg/L	46.9 mV	9.15 ft	200.00 ml/min
9/18/2018 1:45 PM	18:00	6.26 pH	63.10 °F	637.62 µS/cm	0.98 mg/L	44.8 mV	9.15 ft	200.00 ml/min
9/18/2018 1:48 PM	21:00	6.28 pH	62.93 °F	658.48 µS/cm	0.90 mg/L	43.7 mV	9.15 ft	200.00 ml/min
9/18/2018 1:51 PM	24:00	6.28 pH	62.70 °F	700.43 µS/cm	0.80 mg/L	42.2 mV	9.15 ft	200.00 ml/min
9/18/2018 1:54 PM	27:00	6.29 pH	62.57 °F	721.25 µS/cm	0.69 mg/L	39.9 mV	9.15 ft	200.00 ml/min
9/18/2018 1:57 PM	30:00	6.33 pH	62.50 °F	718.99 µS/cm	0.58 mg/L	32.3 mV	9.15 ft	200.00 ml/min
9/18/2018 2:00 PM	33:00	6.30 pH	62.43 °F	756.19 µS/cm	0.61 mg/L	34.9 mV	9.15 ft	200.00 ml/min



**Samples**

Sample ID:	Description:
MW-101	Sample time 1310 Final DTW 9.45 ft btoc
DUP-2	

# Low-Flow Test Report:

Test Date / Time: 9/17/2018 10:22:08 AM

Project: 3Q18 Edmonds Terminal

Operator Name: EK

<b>Location Name: MW-104</b> <b>Well Diameter: 2 in</b> <b>Casing Type: PVC</b> <b>Screen Length: 10 ft</b> <b>Top of Screen: 5 ft</b> <b>Total Depth: 15 ft</b> <b>Initial Depth to Water: 8.5 ft</b>	<b>Pump Type: Geotech geopump series 2</b> <b>Tubing Type: Polyethylene 0.170 x 1/4"</b> <b>Pump Intake From TOC: 11 ft</b> <b>Estimated Total Volume Pumped: 4200 ml</b> <b>Flow Cell Volume: 130 ml</b> <b>Final Flow Rate: 200 ml/min</b> <b>Final Draw Down: 0.15 ft</b>	<b>Instrument Used: Aqua TROLL 600 Vented</b> <b>Serial Number: 467764</b>
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## Test Notes:

## Weather Conditions:

60 and cloudy

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 15 %		
9/17/2018 10:22 AM	00:00	6.10 pH	61.70 °F	611.86 µS/cm	3.49 mg/L	5.2 mV	8.50 ft	200.00 ml/min
9/17/2018 10:25 AM	03:00	6.31 pH	62.26 °F	598.19 µS/cm	0.21 mg/L	-42.7 mV	8.50 ft	200.00 ml/min
9/17/2018 10:28 AM	06:00	6.35 pH	62.34 °F	575.08 µS/cm	0.10 mg/L	-53.4 mV	8.50 ft	200.00 ml/min
9/17/2018 10:31 AM	09:00	6.34 pH	62.42 °F	599.52 µS/cm	0.09 mg/L	-56.4 mV	8.50 ft	200.00 ml/min
9/17/2018 10:34 AM	12:00	6.36 pH	62.39 °F	649.24 µS/cm	0.09 mg/L	-60.3 mV	8.50 ft	200.00 ml/min
9/17/2018 10:37 AM	15:00	6.36 pH	62.46 °F	720.80 µS/cm	0.09 mg/L	-64.8 mV	8.50 ft	200.00 ml/min
9/17/2018 10:40 AM	18:00	6.39 pH	62.47 °F	761.35 µS/cm	0.09 mg/L	-70.8 mV	8.50 ft	200.00 ml/min
9/17/2018 10:43 AM	21:00	6.40 pH	62.43 °F	795.31 µS/cm	0.09 mg/L	-74.9 mV	8.50 ft	200.00 ml/min

## Samples

Sample ID:	Description:
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MW-104

Sample time 0945  
Final DTW 8.65 ft btoc

# Low-Flow Test Report:

**Test Date / Time:** 9/17/2018 1:18:01 PM

**Project:** Edmonds Terminal (2) (2) (2)

**Operator Name:** JI

<p><b>Location Name:</b> MW-129R  <b>Well Diameter:</b> 2 in  <b>Casing Type:</b> Pvc  <b>Screen Length:</b> 10 ft  <b>Top of Screen:</b> 3 ft  <b>Total Depth:</b> 13 ft  <b>Initial Depth to Water:</b> 6.01 ft</p>	<p><b>Pump Type:</b> Geotecg geo pump series 2  <b>Tubing Type:</b> Polyethylene 0.170" x 1/4"  <b>Pump Intake From TOC:</b> 9 ft  <b>Estimated Total Volume Pumped:</b> 5400 ml  <b>Flow Cell Volume:</b> 130 ml  <b>Final Flow Rate:</b> 150 ml/min  <b>Final Draw Down:</b> 0.84 ft</p>	<p><b>Instrument Used:</b> Aqua TROLL 600 Vented  <b>Serial Number:</b> 457166</p>
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## Test Notes:

## Weather Conditions:

Sunny

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 15 %		
9/17/2018 1:18 PM	00:00	6.95 pH	58.43 °F	1,620.8 µS/cm	0.91 mg/L	-73.4 mV	6.01 ft	150.00 ml/min
9/17/2018 1:21 PM	03:00	6.87 pH	57.79 °F	1,443.1 µS/cm	0.20 mg/L	-105.7 mV	6.01 ft	150.00 ml/min
9/17/2018 1:24 PM	06:00	6.85 pH	57.75 °F	1,427.9 µS/cm	0.14 mg/L	-115.4 mV	6.01 ft	150.00 ml/min
9/17/2018 1:27 PM	09:00	6.84 pH	57.76 °F	1,430.5 µS/cm	0.12 mg/L	-118.7 mV	6.01 ft	150.00 ml/min
9/17/2018 1:30 PM	12:00	6.83 pH	57.74 °F	1,426.6 µS/cm	0.11 mg/L	-122.2 mV	6.01 ft	150.00 ml/min
9/17/2018 1:33 PM	15:00	6.82 pH	57.82 °F	1,426.0 µS/cm	0.09 mg/L	-122.2 mV	6.01 ft	150.00 ml/min
9/17/2018 1:36 PM	18:00	6.82 pH	57.95 °F	1,434.3 µS/cm	0.11 mg/L	-124.1 mV	6.01 ft	150.00 ml/min
9/17/2018 1:39 PM	21:00	6.81 pH	58.31 °F	1,439.6 µS/cm	0.13 mg/L	-123.5 mV	6.01 ft	150.00 ml/min
9/17/2018 1:42 PM	24:00	6.80 pH	59.51 °F	1,462.7 µS/cm	0.22 mg/L	-122.9 mV	6.01 ft	150.00 ml/min
9/17/2018 1:45 PM	27:00	6.80 pH	57.67 °F	1,451.2 µS/cm	0.10 mg/L	-124.9 mV	6.01 ft	150.00 ml/min
9/17/2018 1:48 PM	30:00	6.80 pH	57.80 °F	1,452.1 µS/cm	0.09 mg/L	-127.4 mV	6.01 ft	150.00 ml/min
9/17/2018 1:51 PM	33:00	6.80 pH	58.01 °F	1,473.4 µS/cm	0.10 mg/L	-127.6 mV	6.01 ft	150.00 ml/min

9/17/2018 1:54 PM	36:00	6.79 pH	57.93 °F	1,470.6 µS/cm	0.09 mg/L	-128.8 mV	6.01 ft	150.00 ml/min
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## Samples

Sample ID:	Description:
MW-129r	Sample time-1310 Fdtw-6.85

# Low-Flow Test Report:

Test Date / Time: 9/19/2018 11:15:13 AM

Project: 3Q18 Edmonds Terminal

Operator Name: EK

<b>Location Name: MW-139R</b> <b>Well Diameter: 2 in</b> <b>Casing Type: PVC</b> <b>Screen Length: 10 ft</b> <b>Top of Screen: 4.4 ft</b> <b>Total Depth: 14.9 ft</b> <b>Initial Depth to Water: 7.4 ft</b>	<b>Pump Type: Geotech geopump series 2</b> <b>Tubing Type: Polyethylene 0.170 x 1/4"</b> <b>Pump Intake From TOC: 11 ft</b> <b>Estimated Total Volume Pumped: 6000 ml</b> <b>Flow Cell Volume: 130 ml</b> <b>Final Flow Rate: 200 ml/min</b> <b>Final Draw Down: 0.02 ft</b>	<b>Instrument Used: Aqua TROLL 600 Vented</b> <b>Serial Number: 469050</b>
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## Test Notes:

## Weather Conditions:

55 and sunny

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 15 %		
9/19/2018 11:15 AM	00:00	6.71 pH	62.55 °F	27,008 µS/cm	0.36 mg/L	99.8 mV	7.40 ft	200.00 ml/min
9/19/2018 11:18 AM	03:00	6.81 pH	62.69 °F	19,925 µS/cm	0.40 mg/L	92.2 mV	7.40 ft	200.00 ml/min
9/19/2018 11:21 AM	06:00	6.84 pH	62.81 °F	17,161 µS/cm	1.06 mg/L	85.4 mV	7.40 ft	200.00 ml/min
9/19/2018 11:24 AM	09:00	6.84 pH	62.74 °F	17,316 µS/cm	1.07 mg/L	82.1 mV	7.40 ft	200.00 ml/min
9/19/2018 11:27 AM	12:00	6.91 pH	63.07 °F	13,755 µS/cm	1.63 mg/L	68.7 mV	7.40 ft	200.00 ml/min
9/19/2018 11:30 AM	15:00	6.94 pH	63.42 °F	11,865 µS/cm	1.57 mg/L	60.8 mV	7.40 ft	200.00 ml/min
9/19/2018 11:33 AM	18:00	6.96 pH	63.62 °F	9,504.6 µS/cm	1.53 mg/L	52.5 mV	7.40 ft	200.00 ml/min
9/19/2018 11:36 AM	21:00	6.96 pH	63.81 °F	8,950.8 µS/cm	1.56 mg/L	47.1 mV	7.40 ft	200.00 ml/min
9/19/2018 11:39 AM	24:00	6.97 pH	63.96 °F	8,290.9 µS/cm	1.71 mg/L	47.7 mV	7.40 ft	200.00 ml/min
9/19/2018 11:42 AM	27:00	6.97 pH	64.10 °F	8,013.2 µS/cm	1.79 mg/L	48.8 mV	7.40 ft	200.00 ml/min
9/19/2018 11:45 AM	30:00	6.97 pH	64.25 °F	7,920.5 µS/cm	1.81 mg/L	50.0 mV	7.40 ft	200.00 ml/min

**Samples**

Sample ID:	Description:
MW-139R	Sample time 1050 Final DTW 7.42 ft btoc

# Low-Flow Test Report:

Test Date / Time: 9/19/2018 9:53:58 AM

Project: 3Q18 Edmonds Terminal

Operator Name: EK

<b>Location Name: MW-518</b> <b>Well Diameter: 2 in</b> <b>Casing Type: PVC</b> <b>Screen Length: 10 ft</b> <b>Top of Screen: 2.5 ft</b> <b>Total Depth: 12.5 ft</b> <b>Initial Depth to Water: 8.85 ft</b>	<b>Pump Type: Geotech geopump series 2</b> <b>Tubing Type: Polyethylene 0.170 x 1/4"</b> <b>Pump Intake From TOC: 10.5 ft</b> <b>Estimated Total Volume Pumped: 5400 ml</b> <b>Flow Cell Volume: 130 ml</b> <b>Final Flow Rate: 200 ml/min</b> <b>Final Draw Down: 0.05 ft</b>	<b>Instrument Used: Aqua TROLL 600 Vented</b> <b>Serial Number: 469050</b>
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## Test Notes:

## Weather Conditions:

55 and sunny

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 15 %		
9/19/2018 9:53 AM	00:00	6.77 pH	64.73 °F	525.49 µS/cm	0.49 mg/L	-38.7 mV	8.85 ft	200.00 ml/min
9/19/2018 9:56 AM	03:00	6.76 pH	63.83 °F	535.97 µS/cm	0.41 mg/L	-54.5 mV	8.85 ft	200.00 ml/min
9/19/2018 9:59 AM	06:00	6.73 pH	63.21 °F	539.05 µS/cm	0.31 mg/L	-61.2 mV	8.85 ft	200.00 ml/min
9/19/2018 10:02 AM	09:00	6.71 pH	62.96 °F	539.75 µS/cm	0.29 mg/L	-67.2 mV	8.85 ft	200.00 ml/min
9/19/2018 10:05 AM	12:00	6.71 pH	62.73 °F	559.07 µS/cm	0.23 mg/L	-71.0 mV	8.85 ft	200.00 ml/min
9/19/2018 10:08 AM	15:00	6.71 pH	62.56 °F	549.55 µS/cm	0.22 mg/L	-74.3 mV	8.85 ft	200.00 ml/min
9/19/2018 10:11 AM	18:00	6.72 pH	62.43 °F	555.66 µS/cm	0.16 mg/L	-77.5 mV	8.85 ft	200.00 ml/min
9/19/2018 10:14 AM	21:00	6.73 pH	62.30 °F	550.41 µS/cm	0.18 mg/L	-78.0 mV	8.85 ft	200.00 ml/min
9/19/2018 10:17 AM	24:00	6.75 pH	62.32 °F	556.52 µS/cm	0.21 mg/L	-79.8 mV	8.85 ft	200.00 ml/min
9/19/2018 10:20 AM	27:00	6.76 pH	62.19 °F	557.26 µS/cm	0.20 mg/L	-82.0 mV	8.85 ft	200.00 ml/min

## Samples



Sample ID:	Description:
MW-518	Sample time 0925 Final DTW 8.95 ft btoc

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# Low-Flow Test Report:

**Test Date / Time:** 9/18/2018 11:04:56 AM

**Project:** Edmonds Terminal (2) (2) (2) (2) (2) (2)

**Operator Name:** JI

<p><b>Location Name: MW-522</b>  <b>Well Diameter: 2 in</b>  <b>Casing Type: Pvc</b>  <b>Screen Length: 10 ft</b>  <b>Top of Screen: 3 ft</b>  <b>Total Depth: 13 ft</b>  <b>Initial Depth to Water: 8.37 ft</b></p>	<p><b>Pump Type: Geotecg geo pump series 2</b>  <b>Tubing Type: Polyethylene 0.170" x 1/4"</b>  <b>Pump Intake From TOC: 11 ft</b>  <b>Estimated Total Volume Pumped: 6750 ml</b>  <b>Flow Cell Volume: 130 ml</b>  <b>Final Flow Rate: 150 ml/min</b>  <b>Final Draw Down: 0.11 ft</b></p>	<p><b>Instrument Used: Aqua TROLL 600 Vented</b>  <b>Serial Number: 457166</b></p>
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**Test Notes:**

**Weather Conditions:**

Overcast

**Low-Flow Readings:**

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 15 %		
9/18/2018 11:04 AM	00:00	6.73 pH	60.51 °F	617.29 µS/cm	1.16 mg/L	72.5 mV	8.37 ft	150.00 ml/min
9/18/2018 11:07 AM	03:00	6.69 pH	60.23 °F	620.23 µS/cm	0.22 mg/L	44.3 mV	8.37 ft	150.00 ml/min
9/18/2018 11:10 AM	06:00	6.69 pH	60.18 °F	605.23 µS/cm	0.17 mg/L	34.3 mV	8.37 ft	150.00 ml/min
9/18/2018 11:13 AM	09:00	6.69 pH	60.23 °F	618.51 µS/cm	0.17 mg/L	28.3 mV	8.37 ft	150.00 ml/min
9/18/2018 11:16 AM	12:00	6.69 pH	60.17 °F	595.38 µS/cm	0.13 mg/L	25.5 mV	8.37 ft	150.00 ml/min
9/18/2018 11:19 AM	15:00	6.69 pH	60.21 °F	604.25 µS/cm	0.14 mg/L	22.5 mV	8.37 ft	150.00 ml/min
9/18/2018 11:22 AM	18:00	6.70 pH	60.20 °F	604.41 µS/cm	0.11 mg/L	18.4 mV	8.37 ft	150.00 ml/min
9/18/2018 11:25 AM	21:00	6.69 pH	60.22 °F	626.95 µS/cm	0.11 mg/L	17.1 mV	8.37 ft	150.00 ml/min
9/18/2018 11:28 AM	24:00	6.70 pH	60.19 °F	609.04 µS/cm	0.10 mg/L	13.4 mV	8.37 ft	150.00 ml/min
9/18/2018 11:31 AM	27:00	6.70 pH	60.21 °F	624.88 µS/cm	0.10 mg/L	12.9 mV	8.37 ft	150.00 ml/min
9/18/2018 11:34 AM	30:00	6.71 pH	60.18 °F	585.21 µS/cm	0.09 mg/L	8.9 mV	8.37 ft	150.00 ml/min
9/18/2018 11:37 AM	33:00	6.70 pH	60.32 °F	637.30 µS/cm	0.11 mg/L	8.3 mV	8.37 ft	150.00 ml/min

9/18/2018 11:40 AM	36:00	6.71 pH	60.36 °F	626.90 µS/cm	0.10 mg/L	6.2 mV	8.37 ft	150.00 ml/min
9/18/2018 11:43 AM	39:00	6.70 pH	60.40 °F	631.19 µS/cm	0.09 mg/L	7.4 mV	8.37 ft	150.00 ml/min
9/18/2018 11:46 AM	42:00	6.71 pH	60.39 °F	613.65 µS/cm	0.09 mg/L	4.4 mV	8.37 ft	150.00 ml/min
9/18/2018 11:49 AM	45:00	6.71 pH	60.39 °F	622.57 µS/cm	0.10 mg/L	4.8 mV	8.37 ft	150.00 ml/min

## Samples

Sample ID:	Description:
MW-522	Fdtw-8.48 Sample time -1055

# Low-Flow Test Report:

**Test Date / Time:** 9/20/2018 9:08:38 AM

**Project:** Edmonds Terminal (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2)

**Operator Name:** JI

<p><b>Location Name: MW-530</b>  <b>Well Diameter: 1 in</b>  <b>Casing Type: Pvc</b>  <b>Screen Length: 5 ft</b>  <b>Top of Screen: 3 ft</b>  <b>Total Depth: 8 ft</b>  <b>Initial Depth to Water: 5.36 ft</b></p>	<p><b>Pump Type: Geotecg geo pump series 2</b>  <b>Tubing Type: Polyethylene 0.170" x 1/4"</b>  <b>Pump Intake From TOC: 6 ft</b>  <b>Estimated Total Volume Pumped: 3150 ml</b>  <b>Flow Cell Volume: 130 ml</b>  <b>Final Flow Rate: 150 ml/min</b>  <b>Final Draw Down: 0.47 ft</b></p>	<p><b>Instrument Used: Aqua TROLL 600 Vented</b>  <b>Serial Number: 457166</b></p>
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**Test Notes:**

**Weather Conditions:**

Overcast

**Low-Flow Readings:**

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 15 %		
9/20/2018 9:08 AM	00:00	6.60 pH	56.85 °F	31,051 µS/cm	1.33 mg/L	-136.7 mV	5.36 ft	150.00 ml/min
9/20/2018 9:11 AM	03:00	6.59 pH	57.28 °F	28,161 µS/cm	0.39 mg/L	-156.6 mV	5.36 ft	150.00 ml/min
9/20/2018 9:14 AM	06:00	6.61 pH	57.31 °F	29,447 µS/cm	0.30 mg/L	-162.6 mV	5.36 ft	150.00 ml/min
9/20/2018 9:17 AM	09:00	6.64 pH	57.41 °F	29,589 µS/cm	0.24 mg/L	-174.5 mV	5.36 ft	150.00 ml/min
9/20/2018 9:20 AM	12:00	6.67 pH	57.50 °F	29,347 µS/cm	0.12 mg/L	-185.1 mV	5.36 ft	150.00 ml/min
9/20/2018 9:23 AM	15:00	6.71 pH	57.54 °F	27,980 µS/cm	0.09 mg/L	-202.2 mV	5.36 ft	150.00 ml/min
9/20/2018 9:26 AM	18:00	6.74 pH	57.55 °F	26,868 µS/cm	0.09 mg/L	-216.5 mV	5.36 ft	150.00 ml/min
9/20/2018 9:29 AM	21:00	6.76 pH	57.54 °F	25,869 µS/cm	0.09 mg/L	-232.9 mV	5.36 ft	150.00 ml/min

**Samples**

Sample ID:	Description:
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MW-530	Sample time-0835 Fdtw-6.85
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# Low-Flow Test Report:

Test Date / Time: 9/17/2018 12:24:22 PM

Project: Edmonds Terminal (2) (2)

Operator Name: JI

<p><b>Location Name: MW-533</b>  <b>Well Diameter: 2 in</b>  <b>Casing Type: Pvc</b>  <b>Screen Length: 10 ft</b>  <b>Top of Screen: 13 ft</b>  <b>Total Depth: 3 ft</b>  <b>Initial Depth to Water: 5.41 ft</b></p>	<p><b>Pump Type: Geotecg geo pump series 2</b>  <b>Tubing Type: Polyethylene 0.170" x 1/4"</b>  <b>Pump Intake From TOC: 8.5 ft</b>  <b>Estimated Total Volume Pumped: 1285 ml</b>  <b>Flow Cell Volume: 130 ml</b>  <b>Final Flow Rate: 150 ml/min</b>  <b>Final Draw Down: 0 ft</b></p>	<p><b>Instrument Used: Aqua TROLL 600 Vented</b>  <b>Serial Number: 457166</b></p>
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## Test Notes:

## Weather Conditions:

Partly sunny

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 15 %		
9/17/2018 12:24 PM	00:00	6.89 pH	61.69 °F	32,983 µS/cm	2.63 mg/L	148.5 mV	5.41 ft	150.00 ml/min
9/17/2018 12:27 PM	03:00	6.89 pH	60.92 °F	33,257 µS/cm	1.98 mg/L	137.4 mV	5.41 ft	150.00 ml/min
9/17/2018 12:30 PM	06:00	6.89 pH	60.85 °F	33,254 µS/cm	1.93 mg/L	135.5 mV	5.41 ft	150.00 ml/min
9/17/2018 12:32 PM	08:34	6.90 pH	60.88 °F	33,223 µS/cm	1.93 mg/L	138.6 mV	5.41 ft	150.00 ml/min

## Samples

Sample ID:	Description:
MW-533	Sample tine-1149 Fdtw-5.38

# Low-Flow Test Report:

Test Date / Time: 9/17/2018 11:43:08 AM

Project: Edmonds Terminal (2)

Operator Name: JI

<b>Location Name: MW-535</b> <b>Well Diameter: 2 in</b> <b>Casing Type: Pvc</b> <b>Screen Length: 10 ft</b> <b>Top of Screen: 3 ft</b> <b>Total Depth: 13 ft</b> <b>Initial Depth to Water: 5.3 ft</b>	<b>Pump Type: Geotecg geo pump series 2</b> <b>Tubing Type: Polyethylene 0.170" x 1/4"</b> <b>Pump Intake From TOC: 10 ft</b> <b>Estimated Total Volume Pumped: 1350 ml</b> <b>Flow Cell Volume: 130 ml</b> <b>Final Flow Rate: 150 ml/min</b> <b>Final Draw Down: 0.01 ft</b>	<b>Instrument Used: Aqua TROLL 600 Vented</b> <b>Serial Number: 457166</b>
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## Test Notes:

## Weather Conditions:

Overcast

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 15 %		
9/17/2018 11:43 AM	00:00	6.35 pH	61.56 °F	29,372 µS/cm	3.05 mg/L	105.1 mV	5.30 ft	150.00 ml/min
9/17/2018 11:46 AM	03:00	6.78 pH	60.59 °F	29,646 µS/cm	1.87 mg/L	106.8 mV	5.30 ft	150.00 ml/min
9/17/2018 11:49 AM	06:00	6.81 pH	60.28 °F	29,765 µS/cm	1.88 mg/L	110.2 mV	5.30 ft	150.00 ml/min
9/17/2018 11:52 AM	09:00	6.82 pH	60.14 °F	30,075 µS/cm	1.74 mg/L	119.2 mV	5.30 ft	150.00 ml/min

## Samples

Sample ID:	Description:
MW-535	Sample time-1055 Fdtw-5.31

# Low-Flow Test Report:

**Test Date / Time:** 9/18/2018 9:04:15 AM  
**Project:** Edmonds Terminal (2) (2) (2) (2)  
**Operator Name:** JI

<b>Location Name:</b> MW-126 <b>Well Diameter:</b> 2 in <b>Casing Type:</b> Pvc <b>Screen Length:</b> 10 ft <b>Top of Screen:</b> 3.7 ft <b>Total Depth:</b> 14.2 ft <b>Initial Depth to Water:</b> 5.3 ft	<b>Pump Type:</b> Geotecg geo pump series 2 <b>Tubing Type:</b> Polyethylene 0.170" x 1/4" <b>Pump Intake From TOC:</b> 9 ft <b>Estimated Total Volume Pumped:</b> 1305 ml <b>Flow Cell Volume:</b> 130 ml <b>Final Flow Rate:</b> 150 ml/min <b>Final Draw Down:</b> 0.59 ft	<b>Instrument Used:</b> Aqua TROLL 600 Vented <b>Serial Number:</b> 457166
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**Test Notes:**  
Fdtw-5.89

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 15 %		
9/18/2018 9:04 AM	00:00	6.82 pH	56.27 °F	431.88 µS/cm	3.01 mg/L	210.6 mV	5.30 ft	150.00 ml/min
9/18/2018 9:07 AM	03:00	6.81 pH	56.28 °F	464.77 µS/cm	3.30 mg/L	194.2 mV	5.30 ft	150.00 ml/min
9/18/2018 9:09 AM	05:42	6.79 pH	56.34 °F	491.11 µS/cm	3.38 mg/L	214.6 mV	5.30 ft	150.00 ml/min
9/18/2018 9:12 AM	08:42	6.78 pH	56.43 °F	507.62 µS/cm	3.55 mg/L	206.8 mV	5.30 ft	150.00 ml/min

## Samples

Sample ID:	Description:
Mw-126	Sample time -0815 Final dtw-5.88



# Low-Flow Test Report:

**Test Date / Time:** 9/18/2018 9:06:24 AM

**Project:** 3Q18 Edmonds Terminal

**Operator Name:** EK

<p><b>Location Name: MW-143</b>  <b>Well Diameter: 2 in</b>  <b>Casing Type: PVC</b>  <b>Screen Length: 10.1 ft</b>  <b>Top of Screen: 3.5 ft</b>  <b>Total Depth: 14.1 ft</b>  <b>Initial Depth to Water: 5.45 ft</b></p>	<p><b>Pump Type: Geotech geopump series 2</b>  <b>Tubing Type: Polyethylene 0.170 x 1/4"</b>  <b>Pump Intake From TOC: 9.5 ft</b>  <b>Estimated Total Volume Pumped: 8400 ml</b>  <b>Flow Cell Volume: 130 ml</b>  <b>Final Flow Rate: 200 ml/min</b>  <b>Final Draw Down: 3.3 ft</b></p>	<p><b>Instrument Used: Aqua TROLL 600 Vented</b>  <b>Serial Number: 469050</b></p>
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## Test Notes:

## Weather Conditions:

55 and cloudy

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 15 %		
9/18/2018 9:06 AM	00:00	6.22 pH	57.88 °F	369.24 µS/cm	0.38 mg/L	82.0 mV	5.45 ft	200.00 ml/min
9/18/2018 9:09 AM	03:00	6.18 pH	58.43 °F	362.88 µS/cm	0.49 mg/L	75.1 mV	5.45 ft	200.00 ml/min
9/18/2018 9:12 AM	06:00	6.17 pH	58.96 °F	351.38 µS/cm	0.37 mg/L	69.0 mV	5.45 ft	200.00 ml/min
9/18/2018 9:15 AM	09:00	6.16 pH	59.14 °F	341.22 µS/cm	0.21 mg/L	64.5 mV	5.45 ft	200.00 ml/min
9/18/2018 9:18 AM	12:00	6.13 pH	59.30 °F	338.67 µS/cm	0.21 mg/L	61.5 mV	5.45 ft	200.00 ml/min
9/18/2018 9:21 AM	15:00	6.16 pH	59.28 °F	340.48 µS/cm	0.15 mg/L	54.4 mV	5.45 ft	200.00 ml/min
9/18/2018 9:24 AM	18:00	6.15 pH	59.35 °F	343.15 µS/cm	0.13 mg/L	48.0 mV	5.45 ft	200.00 ml/min
9/18/2018 9:27 AM	21:00	6.16 pH	59.28 °F	349.17 µS/cm	0.15 mg/L	40.3 mV	5.45 ft	200.00 ml/min
9/18/2018 9:30 AM	24:00	6.21 pH	59.17 °F	353.72 µS/cm	0.14 mg/L	32.4 mV	5.45 ft	200.00 ml/min
9/18/2018 9:33 AM	27:00	6.21 pH	59.12 °F	357.81 µS/cm	0.14 mg/L	29.1 mV	5.45 ft	200.00 ml/min
9/18/2018 9:36 AM	30:00	6.22 pH	59.17 °F	357.55 µS/cm	0.16 mg/L	27.8 mV	5.45 ft	200.00 ml/min
9/18/2018 9:39 AM	33:00	6.26 pH	59.11 °F	359.21 µS/cm	0.18 mg/L	25.7 mV	5.45 ft	200.00 ml/min

9/18/2018 9:42 AM	36:00	6.26 pH	59.06 °F	360.30 µS/cm	0.19 mg/L	24.6 mV	5.45 ft	200.00 ml/min
9/18/2018 9:45 AM	39:00	6.26 pH	59.04 °F	363.48 µS/cm	0.21 mg/L	24.9 mV	5.45 ft	200.00 ml/min
9/18/2018 9:48 AM	42:00	6.29 pH	59.01 °F	363.86 µS/cm	0.22 mg/L	23.6 mV	5.45 ft	200.00 ml/min

## Samples

Sample ID:	Description:
MW-143	Sample time 0850 Final DTW 8.75 ft btoc

# Low-Flow Test Report:

Test Date / Time: 9/20/2018 12:14:52 PM

Project: 3Q18 Edmonds Terminal (2) (2)

Operator Name: RL

<b>Location Name: MW-502</b> <b>Well Diameter: 2 in</b> <b>Casing Type: PVC</b> <b>Screen Length: 10 ft</b> <b>Top of Screen: 3 ft</b> <b>Total Depth: 13 ft</b> <b>Initial Depth to Water: 5.71 ft</b>	<b>Pump Type: Peristaltic Geo Pump</b> <b>Tubing Type: Poly</b> <b>Pump Intake From TOC: 9 ft</b> <b>Estimated Total Volume Pumped: 6000 gal</b> <b>Flow Cell Volume: 130 ml</b> <b>Final Flow Rate: 200 ml/min</b> <b>Final Draw Down: 6.04 ft</b>	<b>Instrument Used: Aqua TROLL 600 Vented</b> <b>Serial Number: 467764</b>
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## Test Notes:

Sample time 1145

## Weather Conditions:

Cloudy

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 15 %		
9/20/2018 12:14 PM	00:00	6.51 pH	60.47 °F	287.42 µS/cm	3.21 mg/L	30.7 mV	5.71 ft	200.00 ml/min
9/20/2018 12:17 PM	03:00	6.39 pH	60.48 °F	283.84 µS/cm	0.33 mg/L	28.9 mV	5.71 ft	200.00 ml/min
9/20/2018 12:20 PM	06:00	6.35 pH	60.57 °F	281.45 µS/cm	0.13 mg/L	28.8 mV	5.71 ft	200.00 ml/min
9/20/2018 12:23 PM	09:00	6.35 pH	60.29 °F	279.77 µS/cm	0.07 mg/L	27.3 mV	5.71 ft	200.00 ml/min
9/20/2018 12:26 PM	12:00	6.35 pH	60.26 °F	277.41 µS/cm	0.05 mg/L	27.9 mV	5.71 ft	200.00 ml/min
9/20/2018 12:29 PM	15:00	6.35 pH	59.66 °F	273.64 µS/cm	0.04 mg/L	28.8 mV	5.71 ft	200.00 ml/min
9/20/2018 12:32 PM	18:00	6.34 pH	60.17 °F	273.16 µS/cm	0.03 mg/L	29.8 mV	5.71 ft	200.00 ml/min
9/20/2018 12:35 PM	21:00	6.34 pH	59.89 °F	270.57 µS/cm	0.02 mg/L	29.7 mV	5.71 ft	200.00 ml/min
9/20/2018 12:38 PM	24:00	6.34 pH	59.91 °F	268.09 µS/cm	0.01 mg/L	29.7 mV	5.71 ft	200.00 ml/min
9/20/2018 12:41 PM	27:00	6.34 pH	59.99 °F	267.04 µS/cm	0.01 mg/L	29.8 mV	5.71 ft	200.00 ml/min
9/20/2018 12:44 PM	30:00	6.31 pH	59.91 °F	266.09 µS/cm	0.01 mg/L	31.4 mV	5.71 ft	200.00 ml/min

## Samples

# Low-Flow Test Report:

Test Date / Time: 9/20/2018 10:52:50 AM

Project: 3Q18 Edmonds Terminal (2)

Operator Name: RL

<b>Location Name: MW-503</b> <b>Well Diameter: 2 in</b> <b>Casing Type: PVC</b> <b>Screen Length: 10 ft</b> <b>Top of Screen: 3 ft</b> <b>Total Depth: 13 ft</b> <b>Initial Depth to Water: 5.4 ft</b>	<b>Pump Type: Peristaltic Geo Pump</b> <b>Tubing Type: Poly</b> <b>Pump Intake From TOC: 9 ft</b> <b>Estimated Total Volume Pumped: 8400 gal</b> <b>Flow Cell Volume: 130 ml</b> <b>Final Flow Rate: 200 ml/min</b> <b>Final Draw Down: 5.59 ft</b>	<b>Instrument Used: Aqua TROLL 600 Vented</b> <b>Serial Number: 467764</b>
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## Test Notes:

Sample time 1030

Final DTW 5.40 ft btoc

## Weather Conditions:

Cloudy

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 15 %		
9/20/2018 10:52 AM	00:00	6.36 pH	61.45 °F	513.42 µS/cm	1.35 mg/L	16.7 mV	5.40 ft	200.00 ml/min
9/20/2018 10:55 AM	03:00	6.37 pH	61.57 °F	513.90 µS/cm	0.26 mg/L	-3.6 mV	5.40 ft	200.00 ml/min
9/20/2018 10:58 AM	06:00	6.36 pH	61.86 °F	516.93 µS/cm	0.14 mg/L	-15.2 mV	5.40 ft	200.00 ml/min
9/20/2018 11:01 AM	09:00	6.37 pH	61.72 °F	514.30 µS/cm	0.09 mg/L	-22.3 mV	5.40 ft	200.00 ml/min
9/20/2018 11:04 AM	12:00	6.38 pH	61.69 °F	514.46 µS/cm	0.05 mg/L	-27.4 mV	5.40 ft	200.00 ml/min
9/20/2018 11:07 AM	15:00	6.37 pH	61.74 °F	511.99 µS/cm	0.02 mg/L	-30.7 mV	5.40 ft	200.00 ml/min
9/20/2018 11:10 AM	18:00	6.37 pH	61.70 °F	510.80 µS/cm	0.01 mg/L	-32.8 mV	5.40 ft	200.00 ml/min
9/20/2018 11:13 AM	21:00	6.37 pH	61.69 °F	511.41 µS/cm	0.00 mg/L	-35.6 mV	5.40 ft	200.00 ml/min
9/20/2018 11:16 AM	24:00	6.37 pH	61.66 °F	509.21 µS/cm	-0.01 mg/L	-37.8 mV	5.40 ft	200.00 ml/min
9/20/2018 11:19 AM	27:00	6.37 pH	61.64 °F	508.09 µS/cm	-0.02 mg/L	-39.4 mV	5.40 ft	200.00 ml/min
9/20/2018 11:22 AM	30:00	6.38 pH	61.51 °F	507.48 µS/cm	-0.02 mg/L	-41.6 mV	5.40 ft	200.00 ml/min
9/20/2018 11:25 AM	33:00	6.38 pH	61.54 °F	504.86 µS/cm	-0.03 mg/L	-42.9 mV	5.40 ft	200.00 ml/min
9/20/2018 11:28 AM	36:00	6.38 pH	61.51 °F	504.04 µS/cm	-0.03 mg/L	-44.2 mV	5.40 ft	200.00 ml/min

9/20/2018 11:31 AM	39:00	6.39 pH	61.49 °F	503.42 µS/cm	-0.03 mg/L	-45.7 mV	5.40 ft	200.00 ml/min
9/20/2018 11:34 AM	42:00	6.38 pH	61.44 °F	501.57 µS/cm	-0.03 mg/L	-46.3 mV	5.40 ft	200.00 ml/min

## Samples

Sample ID:	Description:
MW-503	

# Low-Flow Test Report:

**Test Date / Time:** 9/20/2018 10:20:27 AM

**Project:** Edmonds Terminal (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2)

**Operator Name:** JI

<p><b>Location Name: MW-504</b>  <b>Well Diameter: 2 in</b>  <b>Casing Type: Pvc</b>  <b>Screen Length: 10 ft</b>  <b>Top of Screen: 3 ft</b>  <b>Total Depth: 13 ft</b>  <b>Initial Depth to Water: 6.89 ft</b></p>	<p><b>Pump Type: Geotecg geo pump series 2</b>  <b>Tubing Type: Polyethylene 0.170" x 1/4"</b>  <b>Pump Intake From TOC: 8.5 ft</b>  <b>Estimated Total Volume Pumped: 2700 ml</b>  <b>Flow Cell Volume: 130 ml</b>  <b>Final Flow Rate: 150 ml/min</b>  <b>Final Draw Down: 0 ft</b></p>	<p><b>Instrument Used: Aqua TROLL 600 Vented</b>  <b>Serial Number: 457166</b></p>
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**Test Notes:**

**Weather Conditions:**

Overcast

**Low-Flow Readings:**

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 15 %		
9/20/2018 10:20 AM	00:00	6.85 pH	61.00 °F	16,427 µS/cm	3.82 mg/L	-47.1 mV	6.89 ft	150.00 ml/min
9/20/2018 10:23 AM	03:00	6.58 pH	63.04 °F	15,660 µS/cm	0.23 mg/L	-80.5 mV	6.89 ft	150.00 ml/min
9/20/2018 10:26 AM	06:00	6.57 pH	63.70 °F	15,349 µS/cm	0.14 mg/L	-89.0 mV	6.89 ft	150.00 ml/min
9/20/2018 10:29 AM	09:00	6.68 pH	64.16 °F	10,797 µS/cm	0.12 mg/L	-100.7 mV	6.89 ft	150.00 ml/min
9/20/2018 10:32 AM	12:00	6.77 pH	64.52 °F	6,850.1 µS/cm	0.11 mg/L	-94.5 mV	6.89 ft	150.00 ml/min
9/20/2018 10:35 AM	15:00	6.77 pH	64.61 °F	6,548.5 µS/cm	0.13 mg/L	-91.4 mV	6.89 ft	150.00 ml/min
9/20/2018 10:38 AM	18:00	6.75 pH	64.63 °F	6,805.1 µS/cm	0.13 mg/L	-84.9 mV	6.89 ft	150.00 ml/min

**Samples**

Sample ID:	Description:
MW-504	Sample time-0950 Fdtw-6.91

# Low-Flow Test Report:

Test Date / Time: 9/20/2018 10:22:47 AM

Project: 3Q18 Edmonds Terminal

Operator Name: EK

<b>Location Name: MW-505</b> <b>Well Diameter: 2 in</b> <b>Casing Type: PVC</b> <b>Screen Length: 10 ft</b> <b>Top of Screen: 3 ft</b> <b>Total Depth: 13 ft</b> <b>Initial Depth to Water: 5.01 ft</b>	<b>Pump Type: Geotech geopump series 2</b> <b>Tubing Type: Polyethylene 0.170 x 1/4"</b> <b>Pump Intake From TOC: 9 ft</b> <b>Estimated Total Volume Pumped: 6000 ml</b> <b>Flow Cell Volume: 130 ml</b> <b>Final Flow Rate: 200 ml/min</b> <b>Final Draw Down: 0.04 ft</b>	<b>Instrument Used: Aqua TROLL 600 Vented</b> <b>Serial Number: 469050</b>
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## Test Notes:

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 15 %		
9/20/2018 10:22 AM	00:00	6.57 pH	62.54 °F	1,248.2 µS/cm	0.30 mg/L	-46.3 mV	5.01 ft	200.00 ml/min
9/20/2018 10:25 AM	03:00	6.58 pH	62.67 °F	1,367.3 µS/cm	0.22 mg/L	-55.6 mV	5.01 ft	200.00 ml/min
9/20/2018 10:28 AM	06:00	6.57 pH	63.03 °F	1,520.3 µS/cm	0.16 mg/L	-61.9 mV	5.01 ft	200.00 ml/min
9/20/2018 10:31 AM	09:00	6.57 pH	63.08 °F	1,625.2 µS/cm	0.11 mg/L	-67.8 mV	5.01 ft	200.00 ml/min
9/20/2018 10:34 AM	12:00	6.59 pH	63.29 °F	1,814.2 µS/cm	0.08 mg/L	-72.7 mV	5.01 ft	200.00 ml/min
9/20/2018 10:37 AM	15:00	6.61 pH	63.39 °F	1,895.2 µS/cm	0.11 mg/L	-76.5 mV	5.01 ft	200.00 ml/min
9/20/2018 10:40 AM	18:00	6.63 pH	63.30 °F	2,049.4 µS/cm	0.14 mg/L	-80.0 mV	5.01 ft	200.00 ml/min
9/20/2018 10:43 AM	21:00	6.64 pH	63.31 °F	2,187.5 µS/cm	0.13 mg/L	-82.2 mV	5.01 ft	200.00 ml/min
9/20/2018 10:46 AM	24:00	6.66 pH	63.36 °F	2,304.9 µS/cm	0.12 mg/L	-84.0 mV	5.01 ft	200.00 ml/min
9/20/2018 10:49 AM	27:00	6.67 pH	63.57 °F	2,404.4 µS/cm	0.11 mg/L	-85.6 mV	5.01 ft	200.00 ml/min
9/20/2018 10:52 AM	30:00	6.69 pH	63.53 °F	2,545.4 µS/cm	0.11 mg/L	-86.4 mV	5.01 ft	200.00 ml/min

## Samples

Sample ID:	Description:
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MW-505	Sample time 0955 Final DTW 5.05 ft btoc
DUP-4	

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# Low-Flow Test Report:

Test Date / Time: 9/19/2018 12:16:13 PM

Project: 3Q18 Edmonds Terminal

Operator Name: EK

<b>Location Name: MW-506</b> <b>Well Diameter: 2 in</b> <b>Casing Type: PVC</b> <b>Screen Length: 10 ft</b> <b>Top of Screen: 3 ft</b> <b>Total Depth: 13 ft</b> <b>Initial Depth to Water: 6.99 ft</b>	<b>Pump Type: Geotech geopump series 2</b> <b>Tubing Type: Polyethylene 0.170 x 1/4"</b> <b>Pump Intake From TOC: 10 ft</b> <b>Estimated Total Volume Pumped: 6000 ml</b> <b>Flow Cell Volume: 130 ml</b> <b>Final Flow Rate: 200 ml/min</b> <b>Final Draw Down: 0.01 ft</b>	<b>Instrument Used: Aqua TROLL 600 Vented</b> <b>Serial Number: 469050</b>
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## Test Notes:

## Weather Conditions:

60 and sunny

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 15 %		
9/19/2018 12:16 PM	00:00	6.92 pH	63.83 °F	1,074.2 µS/cm	0.41 mg/L	-90.5 mV	6.99 ft	200.00 ml/min
9/19/2018 12:19 PM	03:00	6.89 pH	64.05 °F	1,029.2 µS/cm	0.23 mg/L	-100.8 mV	6.99 ft	200.00 ml/min
9/19/2018 12:22 PM	06:00	6.88 pH	64.30 °F	1,019.1 µS/cm	0.15 mg/L	-105.3 mV	6.99 ft	200.00 ml/min
9/19/2018 12:25 PM	09:00	6.88 pH	64.43 °F	1,009.9 µS/cm	0.15 mg/L	-108.5 mV	6.99 ft	200.00 ml/min
9/19/2018 12:28 PM	12:00	6.88 pH	64.55 °F	1,006.4 µS/cm	0.11 mg/L	-110.0 mV	6.99 ft	200.00 ml/min
9/19/2018 12:31 PM	15:00	6.88 pH	64.62 °F	1,002.5 µS/cm	0.10 mg/L	-110.5 mV	6.99 ft	200.00 ml/min
9/19/2018 12:34 PM	18:00	6.88 pH	64.71 °F	998.92 µS/cm	0.07 mg/L	-111.0 mV	6.99 ft	200.00 ml/min
9/19/2018 12:37 PM	21:00	6.88 pH	64.78 °F	1,001.3 µS/cm	0.06 mg/L	-111.5 mV	6.99 ft	200.00 ml/min
9/19/2018 12:40 PM	24:00	6.87 pH	64.73 °F	1,006.7 µS/cm	0.08 mg/L	-111.1 mV	6.99 ft	200.00 ml/min
9/19/2018 12:43 PM	27:00	6.87 pH	64.74 °F	1,010.5 µS/cm	0.09 mg/L	-110.8 mV	6.99 ft	200.00 ml/min
9/19/2018 12:46 PM	30:00	6.87 pH	64.73 °F	1,011.3 µS/cm	0.09 mg/L	-110.9 mV	6.99 ft	200.00 ml/min

**Samples**

Sample ID:	Description:
MW-506	Sample time 1215 Final DTW 7.19 ft btoc

# Low-Flow Test Report:

**Test Date / Time:** 9/19/2018 12:15:59 PM

**Project:** Edmonds Terminal (2) (2) (2) (2) (2) (2) (2) (2) (2) (2)

**Operator Name:** JI

<p><b>Location Name: MW-507</b>  <b>Well Diameter: 2 in</b>  <b>Casing Type: Pvc</b>  <b>Screen Length: 10 ft</b>  <b>Top of Screen: 3 ft</b>  <b>Total Depth: 13 ft</b>  <b>Initial Depth to Water: 7.19 ft</b></p>	<p><b>Pump Type: Geotecg geo pump series 2</b>  <b>Tubing Type: Polyethylene 0.170" x 1/4"</b>  <b>Pump Intake From TOC: 9.5 ft</b>  <b>Estimated Total Volume Pumped: 4950 ml</b>  <b>Flow Cell Volume: 130 ml</b>  <b>Final Flow Rate: 150 ml/min</b>  <b>Final Draw Down: 0.21 ft</b></p>	<p><b>Instrument Used: Aqua TROLL 600 Vented</b>  <b>Serial Number: 457166</b></p>
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**Test Notes:**

**Weather Conditions:**

Sunny

**Low-Flow Readings:**

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 15 %		
9/19/2018 12:15 PM	00:00	6.99 pH	66.39 °F	1,280.1 µS/cm	0.49 mg/L	149.7 mV	7.19 ft	150.00 ml/min
9/19/2018 12:18 PM	03:00	6.93 pH	65.89 °F	970.20 µS/cm	0.24 mg/L	122.0 mV	7.19 ft	150.00 ml/min
9/19/2018 12:21 PM	06:00	6.90 pH	66.02 °F	936.50 µS/cm	0.20 mg/L	111.9 mV	7.19 ft	150.00 ml/min
9/19/2018 12:24 PM	09:00	6.91 pH	65.64 °F	907.31 µS/cm	0.18 mg/L	98.0 mV	7.19 ft	150.00 ml/min
9/19/2018 12:27 PM	12:00	6.89 pH	66.12 °F	929.42 µS/cm	0.17 mg/L	96.8 mV	7.19 ft	150.00 ml/min
9/19/2018 12:30 PM	15:00	6.89 pH	66.17 °F	936.09 µS/cm	0.21 mg/L	94.0 mV	7.19 ft	150.00 ml/min
9/19/2018 12:33 PM	18:00	6.88 pH	66.22 °F	939.86 µS/cm	0.24 mg/L	100.1 mV	7.19 ft	150.00 ml/min
9/19/2018 12:36 PM	21:00	6.87 pH	66.21 °F	943.95 µS/cm	0.28 mg/L	97.5 mV	7.19 ft	150.00 ml/min
9/19/2018 12:39 PM	24:00	6.86 pH	65.02 °F	889.82 µS/cm	0.13 mg/L	99.0 mV	7.19 ft	150.00 ml/min
9/19/2018 12:42 PM	27:00	6.86 pH	64.88 °F	881.58 µS/cm	0.11 mg/L	83.0 mV	7.19 ft	150.00 ml/min
9/19/2018 12:45 PM	30:00	6.86 pH	64.89 °F	882.28 µS/cm	0.11 mg/L	85.9 mV	7.19 ft	150.00 ml/min
9/19/2018 12:48 PM	33:00	6.85 pH	64.84 °F	878.46 µS/cm	0.10 mg/L	83.2 mV	7.19 ft	150.00 ml/min

**Samples**

Sample ID:	Description:
MW-507	Sample time-1230 Fdtw-7.40

# Low-Flow Test Report:

**Test Date / Time:** 9/19/2018 11:20:34 AM

**Project:** Edmonds Terminal (2) (2) (2) (2) (2) (2) (2) (2) (2)

**Operator Name:** JI

<p><b>Location Name: MW-509</b>  <b>Well Diameter: 2 in</b>  <b>Casing Type: Pvc</b>  <b>Screen Length: 10 ft</b>  <b>Top of Screen: 13 ft</b>  <b>Total Depth: 3 ft</b>  <b>Initial Depth to Water: 3.84 ft</b></p>	<p><b>Pump Type: Geotecg geo pump series 2</b>  <b>Tubing Type: Polyethylene 0.170" x 1/4"</b>  <b>Pump Intake From TOC: 7 ft</b>  <b>Estimated Total Volume Pumped: 2250 ml</b>  <b>Flow Cell Volume: 130 ml</b>  <b>Final Flow Rate: 150 ml/min</b>  <b>Final Draw Down: 0 ft</b></p>	<p><b>Instrument Used: Aqua TROLL 600 Vented</b>  <b>Serial Number: 457166</b></p>
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**Test Notes:**

**Weather Conditions:**

Sunny

**Low-Flow Readings:**

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 15 %		
9/19/2018 11:20 AM	00:00	6.38 pH	66.14 °F	35,413 µS/cm	4.16 mg/L	167.9 mV	3.84 ft	150.00 ml/min
9/19/2018 11:23 AM	03:00	6.48 pH	66.00 °F	36,835 µS/cm	0.22 mg/L	108.0 mV	3.84 ft	150.00 ml/min
9/19/2018 11:26 AM	06:00	6.49 pH	65.95 °F	33,247 µS/cm	0.16 mg/L	99.7 mV	3.84 ft	150.00 ml/min
9/19/2018 11:29 AM	09:00	6.50 pH	66.03 °F	29,931 µS/cm	0.13 mg/L	94.3 mV	3.84 ft	150.00 ml/min
9/19/2018 11:32 AM	12:00	6.50 pH	66.01 °F	30,253 µS/cm	0.12 mg/L	89.3 mV	3.84 ft	150.00 ml/min
9/19/2018 11:35 AM	15:00	6.50 pH	66.14 °F	29,888 µS/cm	0.13 mg/L	88.9 mV	3.84 ft	150.00 ml/min

**Samples**

Sample ID:	Description:
MW-509	Fdtw-3.83 Sample time-1044

# Low-Flow Test Report:

Test Date / Time: 9/20/2018 9:55:14 AM

Project: 3Q18 Edmonds Terminal

Operator Name: RL

<b>Location Name: MW-511</b> <b>Well Diameter: 2 in</b> <b>Casing Type: PVC</b> <b>Screen Length: 10 ft</b> <b>Top of Screen: 5 ft</b> <b>Total Depth: 15 ft</b> <b>Initial Depth to Water: 8.35 ft</b>	<b>Pump Type: Peristaltic Geo Pump</b> <b>Tubing Type: Poly</b> <b>Estimated Total Volume Pumped: 3000 ml</b> <b>Flow Cell Volume: 130 ml</b> <b>Final Flow Rate: 200 ml/min</b> <b>Final Draw Down: 8.43 ft</b>	<b>Instrument Used: Aqua TROLL 600 Vented</b> <b>Serial Number: 467764</b>
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## Test Notes:

Sample time 0900

## Weather Conditions:

Cloudy

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 15 %		
9/20/2018 9:55 AM	00:00	6.82 pH	58.48 °F	225.14 µS/cm	4.46 mg/L	188.4 mV	8.35 ft	200.00 ml/min
9/20/2018 9:58 AM	03:00	6.54 pH	57.58 °F	226.24 µS/cm	3.01 mg/L	200.9 mV	8.35 ft	200.00 ml/min
9/20/2018 10:01 AM	06:00	6.44 pH	57.59 °F	237.14 µS/cm	2.43 mg/L	206.3 mV	8.35 ft	200.00 ml/min
9/20/2018 10:04 AM	09:00	6.42 pH	57.47 °F	240.09 µS/cm	2.08 mg/L	208.4 mV	8.35 ft	200.00 ml/min
9/20/2018 10:07 AM	12:00	6.41 pH	57.02 °F	242.15 µS/cm	2.00 mg/L	209.5 mV	8.35 ft	200.00 ml/min
9/20/2018 10:10 AM	15:00	6.40 pH	56.90 °F	242.90 µS/cm	1.94 mg/L	210.4 mV	8.35 ft	200.00 ml/min

## Samples

Sample ID:	Description:
MW-511	

# Low-Flow Test Report:

**Test Date / Time:** 9/20/2018 12:31:29 PM

**Project:** 3Q18 Edmonds Terminal

**Operator Name:** EK

<p><b>Location Name: MW-512</b>  <b>Well Diameter: 2 in</b>  <b>Casing Type: PVC</b>  <b>Screen Length: 10 ft</b>  <b>Top of Screen: 3 ft</b>  <b>Total Depth: 13 ft</b>  <b>Initial Depth to Water: 6.85 ft</b></p>	<p><b>Pump Type: Geotech geopump series 2</b>  <b>Tubing Type: Polyethylene 0.170 x 1/4"</b>  <b>Pump Intake From TOC: 9.5 ft</b>  <b>Estimated Total Volume Pumped: 7200 ml</b>  <b>Flow Cell Volume: 130 ml</b>  <b>Final Flow Rate: 200 ml/min</b>  <b>Final Draw Down: 0.01 ft</b></p>	<p><b>Instrument Used: Aqua TROLL 600 Vented</b>  <b>Serial Number: 469050</b></p>
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## Test Notes:

## Weather Conditions:

60 and cloudy

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 15 %		
9/20/2018 12:31 PM	00:00	6.85 pH	63.54 °F	810.34 µS/cm	0.47 mg/L	12.3 mV	6.85 ft	200.00 ml/min
9/20/2018 12:34 PM	03:00	6.92 pH	64.05 °F	766.18 µS/cm	0.21 mg/L	-19.0 mV	6.85 ft	200.00 ml/min
9/20/2018 12:37 PM	06:00	6.96 pH	64.52 °F	756.33 µS/cm	0.15 mg/L	-33.6 mV	6.85 ft	200.00 ml/min
9/20/2018 12:40 PM	09:00	6.96 pH	64.91 °F	760.63 µS/cm	0.13 mg/L	-42.0 mV	6.85 ft	200.00 ml/min
9/20/2018 12:43 PM	12:00	6.95 pH	65.06 °F	761.74 µS/cm	0.13 mg/L	-60.6 mV	6.85 ft	200.00 ml/min
9/20/2018 12:46 PM	15:00	6.94 pH	65.36 °F	766.07 µS/cm	0.11 mg/L	-79.2 mV	6.85 ft	200.00 ml/min
9/20/2018 12:49 PM	18:00	6.91 pH	65.43 °F	766.28 µS/cm	0.10 mg/L	-91.4 mV	6.85 ft	200.00 ml/min
9/20/2018 12:52 PM	21:00	6.88 pH	65.75 °F	776.50 µS/cm	0.04 mg/L	-100.1 mV	6.85 ft	200.00 ml/min
9/20/2018 12:55 PM	24:00	6.87 pH	65.93 °F	768.98 µS/cm	0.04 mg/L	-107.9 mV	6.85 ft	200.00 ml/min
9/20/2018 12:58 PM	27:00	6.85 pH	66.09 °F	763.32 µS/cm	0.05 mg/L	-114.2 mV	6.85 ft	200.00 ml/min
9/20/2018 1:01 PM	30:00	6.85 pH	66.06 °F	761.36 µS/cm	0.06 mg/L	-117.4 mV	6.85 ft	200.00 ml/min
9/20/2018 1:04 PM	33:00	6.83 pH	65.95 °F	758.51 µS/cm	0.06 mg/L	-119.1 mV	6.85 ft	200.00 ml/min

9/20/2018 1:07 PM	36:00	6.83 pH	66.02 °F	755.95 µS/cm	0.06 mg/L	-120.3 mV	6.85 ft	200.00 ml/min
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## Samples

Sample ID:	Description:
MW-512	Sample time 1215 Final DTW 6.86 ft btoc



# Low-Flow Test Report:

**Test Date / Time:** 9/20/2018 11:43:31 AM

**Project:** Edmonds Terminal (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2)

**Operator Name:** JI

<b>Location Name: MW-513</b> <b>Well Diameter: 2 in</b> <b>Casing Type: Pvc</b> <b>Screen Length: 10 ft</b> <b>Top of Screen: 3 ft</b> <b>Total Depth: 13 ft</b> <b>Initial Depth to Water: 4.69 ft</b>	<b>Pump Type: Geotecg geo pump series 2</b> <b>Tubing Type: Polyethylene 0.170" x 1/4"</b> <b>Pump Intake From TOC: 8 ft</b> <b>Estimated Total Volume Pumped: 4775 ml</b> <b>Flow Cell Volume: 130 ml</b> <b>Final Flow Rate: 150 ml/min</b> <b>Final Draw Down: 0.02 ft</b>	<b>Instrument Used: Aqua TROLL 600 Vented</b> <b>Serial Number: 457166</b>
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## Test Notes:

## Weather Conditions:

Overcast

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 15 %		
9/20/2018 11:43 AM	00:00	6.74 pH	63.44 °F	3,088.0 µS/cm	0.51 mg/L	-59.3 mV	4.69 ft	150.00 ml/min
9/20/2018 11:46 AM	03:00	6.71 pH	63.72 °F	2,996.0 µS/cm	0.25 mg/L	-89.3 mV	4.69 ft	150.00 ml/min
9/20/2018 11:49 AM	06:00	6.71 pH	63.96 °F	2,975.3 µS/cm	0.22 mg/L	-92.2 mV	4.69 ft	150.00 ml/min
9/20/2018 11:52 AM	09:00	6.72 pH	64.00 °F	2,579.1 µS/cm	0.30 mg/L	-89.7 mV	4.69 ft	150.00 ml/min
9/20/2018 11:55 AM	12:00	6.72 pH	64.07 °F	2,239.6 µS/cm	0.53 mg/L	-78.3 mV	4.69 ft	150.00 ml/min
9/20/2018 11:58 AM	15:00	6.73 pH	64.08 °F	1,986.3 µS/cm	0.65 mg/L	-73.6 mV	4.69 ft	150.00 ml/min
9/20/2018 12:01 PM	18:00	6.74 pH	64.21 °F	1,849.6 µS/cm	0.72 mg/L	-67.3 mV	4.69 ft	150.00 ml/min
9/20/2018 12:09 PM	25:50	6.76 pH	64.20 °F	1,773.0 µS/cm	0.91 mg/L	-58.0 mV	4.69 ft	150.00 ml/min
9/20/2018 12:12 PM	28:50	6.75 pH	64.20 °F	1,713.7 µS/cm	0.94 mg/L	-60.5 mV	4.69 ft	150.00 ml/min
9/20/2018 12:15 PM	31:50	6.76 pH	64.33 °F	1,713.0 µS/cm	0.83 mg/L	-61.0 mV	4.69 ft	150.00 ml/min

**Samples**

Sample ID:	Description:
MW-513	Sample time-1130 Fdtw-4.71

# Low-Flow Test Report:

**Test Date / Time:** 9/20/2018 11:43:49 AM

**Project:** 3Q18 Edmonds Terminal

**Operator Name:** EK

<p><b>Location Name:</b> MW-514  <b>Well Diameter:</b> 2 in  <b>Casing Type:</b> PVC  <b>Screen Length:</b> 10 ft  <b>Top of Screen:</b> 3 ft  <b>Total Depth:</b> 13 ft  <b>Initial Depth to Water:</b> 5.05 ft</p>	<p><b>Pump Type:</b> Geotech geopump series 2  <b>Tubing Type:</b> Polyethylene 0.170 x 1/4"  <b>Pump Intake From TOC:</b> 9 ft  <b>Estimated Total Volume Pumped:</b> 3600 ml  <b>Flow Cell Volume:</b> 130 ml  <b>Final Flow Rate:</b> 200 ml/min  <b>Final Draw Down:</b> 0.01 ft</p>	<p><b>Instrument Used:</b> Aqua TROLL 600 Vented  <b>Serial Number:</b> 469050</p>
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**Test Notes:**

**Weather Conditions:**

55 and cloudy

**Low-Flow Readings:**

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 15 %		
9/20/2018 11:43 AM	00:00	6.57 pH	62.20 °F	1,306.1 µS/cm	0.36 mg/L	33.2 mV	5.05 ft	200.00 ml/min
9/20/2018 11:46 AM	03:00	6.57 pH	62.48 °F	1,241.6 µS/cm	0.18 mg/L	33.7 mV	5.05 ft	200.00 ml/min
9/20/2018 11:49 AM	06:00	6.58 pH	62.65 °F	1,232.0 µS/cm	0.15 mg/L	32.9 mV	5.05 ft	200.00 ml/min
9/20/2018 11:52 AM	09:00	6.58 pH	62.84 °F	1,224.8 µS/cm	0.14 mg/L	33.0 mV	5.05 ft	200.00 ml/min
9/20/2018 11:55 AM	12:00	6.59 pH	62.92 °F	1,217.6 µS/cm	0.12 mg/L	32.7 mV	5.05 ft	200.00 ml/min
9/20/2018 11:58 AM	15:00	6.60 pH	63.08 °F	1,207.8 µS/cm	0.13 mg/L	31.7 mV	5.05 ft	200.00 ml/min
9/20/2018 12:01 PM	18:00	6.59 pH	63.26 °F	1,230.4 µS/cm	0.13 mg/L	31.8 mV	5.05 ft	200.00 ml/min

**Samples**

Sample ID:	Description:
MW-514	Sample time-1110 Final dtw-5.06

# Low-Flow Test Report:

**Test Date / Time:** 9/19/2018 9:56:31 AM

**Project:** Edmonds Terminal (2) (2) (2) (2) (2) (2) (2) (2)

**Operator Name:** JI

<p><b>Location Name: MW-515</b>  <b>Well Diameter: 2 in</b>  <b>Casing Type: Pvc</b>  <b>Screen Length: 10 ft</b>  <b>Top of Screen: 13 ft</b>  <b>Total Depth: 3 ft</b>  <b>Initial Depth to Water: 5.19 ft</b></p>	<p><b>Pump Type: Geotecg geo pump series 2</b>  <b>Tubing Type: Polyethylene 0.170" x 1/4"</b>  <b>Pump Intake From TOC: 8 ft</b>  <b>Estimated Total Volume Pumped: 6750 ml</b>  <b>Flow Cell Volume: 130 ml</b>  <b>Final Flow Rate: 150 ml/min</b>  <b>Final Draw Down: 0.01 ft</b></p>	<p><b>Instrument Used: Aqua TROLL 600 Vented</b>  <b>Serial Number: 457166</b></p>
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**Test Notes:**

**Weather Conditions:**

Sunny

**Low-Flow Readings:**

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 15 %		
9/19/2018 9:56 AM	00:00	6.93 pH	62.91 °F	1,837.2 µS/cm	4.20 mg/L	90.1 mV	5.19 ft	150.00 ml/min
9/19/2018 9:59 AM	03:00	6.96 pH	64.37 °F	1,739.0 µS/cm	0.26 mg/L	35.9 mV	5.19 ft	150.00 ml/min
9/19/2018 10:02 AM	06:00	6.94 pH	65.00 °F	1,650.4 µS/cm	0.17 mg/L	34.8 mV	5.19 ft	150.00 ml/min
9/19/2018 10:05 AM	09:00	6.94 pH	65.61 °F	1,524.6 µS/cm	0.11 mg/L	22.9 mV	5.19 ft	150.00 ml/min
9/19/2018 10:08 AM	12:00	6.95 pH	65.76 °F	1,473.8 µS/cm	0.11 mg/L	16.5 mV	5.19 ft	150.00 ml/min
9/19/2018 10:11 AM	15:00	6.96 pH	65.85 °F	1,445.2 µS/cm	0.11 mg/L	11.5 mV	5.19 ft	150.00 ml/min
9/19/2018 10:14 AM	18:00	6.96 pH	66.02 °F	1,405.4 µS/cm	0.12 mg/L	2.7 mV	5.19 ft	150.00 ml/min
9/19/2018 10:17 AM	21:00	6.97 pH	66.03 °F	1,416.5 µS/cm	0.12 mg/L	-3.9 mV	5.19 ft	150.00 ml/min
9/19/2018 10:20 AM	24:00	6.97 pH	66.12 °F	1,406.5 µS/cm	0.11 mg/L	-1.5 mV	5.19 ft	150.00 ml/min
9/19/2018 10:23 AM	27:00	6.97 pH	66.08 °F	1,398.7 µS/cm	0.10 mg/L	2.3 mV	5.19 ft	150.00 ml/min
9/19/2018 10:26 AM	30:00	6.97 pH	66.23 °F	1,382.7 µS/cm	0.09 mg/L	4.3 mV	5.19 ft	150.00 ml/min
9/19/2018 10:29 AM	33:00	6.97 pH	66.23 °F	1,401.6 µS/cm	0.08 mg/L	8.3 mV	5.19 ft	150.00 ml/min

9/19/2018 10:32 AM	36:00	6.97 pH	66.24 °F	1,394.4 µS/cm	0.08 mg/L	9.8 mV	5.19 ft	150.00 ml/min
9/19/2018 10:35 AM	39:00	6.97 pH	66.15 °F	1,417.2 µS/cm	0.09 mg/L	17.2 mV	5.19 ft	150.00 ml/min
9/19/2018 10:38 AM	42:00	6.97 pH	65.93 °F	1,431.1 µS/cm	0.10 mg/L	17.0 mV	5.19 ft	150.00 ml/min
9/19/2018 10:41 AM	45:00	6.97 pH	65.72 °F	1,433.6 µS/cm	0.10 mg/L	19.9 mV	5.19 ft	150.00 ml/min

## Samples

Sample ID:	Description:
MW-515	Sample time-0945 Fdtw-5.20

# Low-Flow Test Report:

**Test Date / Time:** 9/19/2018 9:02:37 AM

**Project:** Edmonds Terminal (2) (2) (2) (2) (2) (2) (2)

**Operator Name:** JI

<p><b>Location Name:</b> MW-516  <b>Well Diameter:</b> 2 in  <b>Casing Type:</b> Pvc  <b>Screen Length:</b> 10 ft  <b>Top of Screen:</b> 3 ft  <b>Total Depth:</b> 13 ft  <b>Initial Depth to Water:</b> 4.82 ft</p>	<p><b>Pump Type:</b> Geotecg geo pump series 2  <b>Tubing Type:</b> Polyethylene 0.170" x 1/4"  <b>Pump Intake From TOC:</b> 7.5 ft  <b>Estimated Total Volume Pumped:</b> 4500 ml  <b>Flow Cell Volume:</b> 130 ml  <b>Final Flow Rate:</b> 150 ml/min  <b>Final Draw Down:</b> 0 ft</p>	<p><b>Instrument Used:</b> Aqua TROLL 600 Vented  <b>Serial Number:</b> 457166</p>
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**Test Notes:**

**Weather Conditions:**

Sunny 46

**Low-Flow Readings:**

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 15 %		
9/19/2018 9:02 AM	00:00	6.94 pH	55.04 °F	1,272.6 µS/cm	6.23 mg/L	214.5 mV	4.82 ft	150.00 ml/min
9/19/2018 9:05 AM	03:00	6.77 pH	62.05 °F	1,230.6 µS/cm	1.81 mg/L	149.6 mV	4.82 ft	150.00 ml/min
9/19/2018 9:08 AM	06:00	6.78 pH	63.13 °F	1,247.3 µS/cm	1.45 mg/L	136.3 mV	4.82 ft	150.00 ml/min
9/19/2018 9:11 AM	09:00	6.79 pH	63.97 °F	1,203.7 µS/cm	1.48 mg/L	123.4 mV	4.82 ft	150.00 ml/min
9/19/2018 9:14 AM	12:00	6.79 pH	64.19 °F	1,195.2 µS/cm	1.24 mg/L	123.3 mV	4.82 ft	150.00 ml/min
9/19/2018 9:17 AM	15:00	6.78 pH	64.50 °F	1,180.9 µS/cm	0.84 mg/L	116.2 mV	4.82 ft	150.00 ml/min
9/19/2018 9:20 AM	18:00	6.78 pH	64.84 °F	1,159.8 µS/cm	0.58 mg/L	111.8 mV	4.82 ft	150.00 ml/min
9/19/2018 9:23 AM	21:00	6.76 pH	65.32 °F	1,172.8 µS/cm	0.58 mg/L	105.8 mV	4.82 ft	150.00 ml/min
9/19/2018 9:26 AM	24:00	6.77 pH	65.52 °F	1,141.0 µS/cm	0.70 mg/L	108.0 mV	4.82 ft	150.00 ml/min
9/19/2018 9:29 AM	27:00	6.77 pH	65.57 °F	1,135.7 µS/cm	0.70 mg/L	104.9 mV	4.82 ft	150.00 ml/min
9/19/2018 9:32 AM	30:00	6.77 pH	65.70 °F	1,149.7 µS/cm	0.65 mg/L	106.6 mV	4.82 ft	150.00 ml/min

**Samples**

Sample ID:	Description:
MW-516	Sample time-0835 Ftdw-4.82

# Low-Flow Test Report:

Test Date / Time: 9/19/2018 9:01:53 AM

Project: 3Q18 Edmonds Terminal

Operator Name: EK

<b>Location Name: MW-517</b> <b>Well Diameter: 2 in</b> <b>Casing Type: PVC</b> <b>Screen Length: 10 ft</b> <b>Top of Screen: 3 ft</b> <b>Total Depth: 13 ft</b> <b>Initial Depth to Water: 5.7 ft</b>	<b>Pump Type: Geotech geopump series 2</b> <b>Tubing Type: Polyethylene 0.170 x 1/4"</b> <b>Pump Intake From TOC: 9 ft</b> <b>Estimated Total Volume Pumped: 4200 ml</b> <b>Flow Cell Volume: 130 ml</b> <b>Final Flow Rate: 200 ml/min</b> <b>Final Draw Down: 0 ft</b>	<b>Instrument Used: Aqua TROLL 600 Vented</b> <b>Serial Number: 469050</b>
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## Test Notes:

## Weather Conditions:

50 and sunny

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 15 %		
9/19/2018 9:01 AM	00:00	6.67 pH	62.99 °F	1,008.5 µS/cm	1.09 mg/L	129.3 mV	5.70 ft	200.00 ml/min
9/19/2018 9:04 AM	03:00	6.72 pH	64.28 °F	946.75 µS/cm	1.34 mg/L	107.8 mV	5.70 ft	200.00 ml/min
9/19/2018 9:07 AM	06:00	6.72 pH	64.94 °F	933.72 µS/cm	1.31 mg/L	100.4 mV	5.70 ft	200.00 ml/min
9/19/2018 9:10 AM	09:00	6.73 pH	65.27 °F	969.25 µS/cm	1.09 mg/L	94.0 mV	5.70 ft	200.00 ml/min
9/19/2018 9:13 AM	12:00	6.71 pH	65.75 °F	954.38 µS/cm	0.85 mg/L	91.2 mV	5.70 ft	200.00 ml/min
9/19/2018 9:16 AM	15:00	6.72 pH	66.30 °F	962.76 µS/cm	0.69 mg/L	88.7 mV	5.70 ft	200.00 ml/min
9/19/2018 9:19 AM	18:00	6.71 pH	66.80 °F	963.42 µS/cm	0.66 mg/L	87.4 mV	5.70 ft	200.00 ml/min
9/19/2018 9:22 AM	21:00	6.71 pH	67.08 °F	941.93 µS/cm	0.64 mg/L	84.6 mV	5.70 ft	200.00 ml/min

## Samples

Sample ID:	Description:
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MW-517

Sample time 0830

Final DTW 5.70 ft btoc

Created using VuSitu from In-Situ, Inc.

# Low-Flow Test Report:

Test Date / Time: 9/18/2018 12:22:28 PM

Project: 3Q18 Edmonds Terminal

Operator Name: EK

<b>Location Name: MW-519</b> <b>Well Diameter: 2 in</b> <b>Casing Type: PVC</b> <b>Screen Length: 10 ft</b> <b>Top of Screen: 3 ft</b> <b>Total Depth: 13 ft</b> <b>Initial Depth to Water: 7.11 ft</b>	<b>Pump Type: Geotech geopump series 2</b> <b>Tubing Type: Polyethylene 0.170 x 1/4"</b> <b>Pump Intake From TOC: 10 ft</b> <b>Estimated Total Volume Pumped: 7200 ml</b> <b>Flow Cell Volume: 130 ml</b> <b>Final Flow Rate: 200 ml/min</b> <b>Final Draw Down: 0.04 ft</b>	<b>Instrument Used: Aqua TROLL 600 Vented</b> <b>Serial Number: 469050</b>
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## Test Notes:

## Weather Conditions:

65 and sunny

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 15 %		
9/18/2018 12:22 PM	00:00	6.74 pH	67.63 °F	474.32 µS/cm	0.63 mg/L	-47.0 mV	7.11 ft	200.00 ml/min
9/18/2018 12:25 PM	03:00	6.74 pH	67.56 °F	500.85 µS/cm	0.25 mg/L	-50.8 mV	7.11 ft	200.00 ml/min
9/18/2018 12:28 PM	06:00	6.75 pH	67.78 °F	512.00 µS/cm	0.19 mg/L	-54.1 mV	7.11 ft	200.00 ml/min
9/18/2018 12:31 PM	09:00	6.75 pH	68.26 °F	523.78 µS/cm	0.15 mg/L	-55.5 mV	7.11 ft	200.00 ml/min
9/18/2018 12:34 PM	12:00	6.75 pH	68.85 °F	535.09 µS/cm	0.14 mg/L	-56.7 mV	7.11 ft	200.00 ml/min
9/18/2018 12:37 PM	15:00	6.75 pH	69.19 °F	545.92 µS/cm	0.13 mg/L	-58.3 mV	7.11 ft	200.00 ml/min
9/18/2018 12:40 PM	18:00	6.75 pH	69.25 °F	566.46 µS/cm	0.11 mg/L	-59.6 mV	7.11 ft	200.00 ml/min
9/18/2018 12:43 PM	21:00	6.74 pH	69.97 °F	578.40 µS/cm	0.11 mg/L	-60.1 mV	7.11 ft	200.00 ml/min
9/18/2018 12:46 PM	24:00	6.73 pH	70.22 °F	556.10 µS/cm	0.08 mg/L	-60.7 mV	7.11 ft	200.00 ml/min
9/18/2018 12:49 PM	27:00	6.73 pH	70.35 °F	567.15 µS/cm	0.07 mg/L	-60.2 mV	7.11 ft	200.00 ml/min
9/18/2018 12:52 PM	30:00	6.74 pH	70.57 °F	567.42 µS/cm	0.07 mg/L	-60.3 mV	7.11 ft	200.00 ml/min
9/18/2018 12:55 PM	33:00	6.73 pH	70.52 °F	584.31 µS/cm	0.06 mg/L	-60.6 mV	7.11 ft	200.00 ml/min

9/18/2018 12:58 PM	36:00	6.72 pH	70.45 °F	575.86 µS/cm	0.05 mg/L	-61.0 mV	7.11 ft	200.00 ml/min
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## Samples

Sample ID:	Description:
MW-519	Sample time 1200 Final DTW 7.15 ft btoc

# Low-Flow Test Report:

Test Date / Time: 9/18/2018 10:18:24 AM

Project: 3Q18 Edmonds Terminal

Operator Name: EK

<b>Location Name: MW-520</b> <b>Well Diameter: 2 in</b> <b>Casing Type: PVC</b> <b>Screen Length: 10 ft</b> <b>Top of Screen: 3 ft</b> <b>Total Depth: 13 ft</b> <b>Initial Depth to Water: 7.8 ft</b>	<b>Pump Type: Geotech geopump series 2</b> <b>Tubing Type: Polyethylene 0.170 x 1/4"</b> <b>Pump Intake From TOC: 10.5 ft</b> <b>Estimated Total Volume Pumped: 6000 ml</b> <b>Flow Cell Volume: 130 ml</b> <b>Final Flow Rate: 200 ml/min</b> <b>Final Draw Down: 0.05 ft</b>	<b>Instrument Used: Aqua TROLL 600 Vented</b> <b>Serial Number: 469050</b>
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## Test Notes:

## Weather Conditions:

55 and cloudy

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 15 %		
9/18/2018 10:18 AM	00:00	6.79 pH	64.07 °F	948.81 µS/cm	0.64 mg/L	24.9 mV	7.80 ft	200.00 ml/min
9/18/2018 10:21 AM	03:00	6.80 pH	64.67 °F	941.06 µS/cm	0.33 mg/L	11.9 mV	7.80 ft	200.00 ml/min
9/18/2018 10:24 AM	06:00	6.80 pH	65.23 °F	937.98 µS/cm	0.21 mg/L	10.5 mV	7.80 ft	200.00 ml/min
9/18/2018 10:27 AM	09:00	6.79 pH	65.50 °F	936.70 µS/cm	0.21 mg/L	6.4 mV	7.80 ft	200.00 ml/min
9/18/2018 10:30 AM	12:00	6.79 pH	65.70 °F	933.50 µS/cm	0.22 mg/L	9.1 mV	7.80 ft	200.00 ml/min
9/18/2018 10:33 AM	15:00	6.79 pH	65.86 °F	930.95 µS/cm	0.50 mg/L	11.2 mV	7.80 ft	200.00 ml/min
9/18/2018 10:36 AM	18:00	6.79 pH	65.85 °F	929.49 µS/cm	0.87 mg/L	7.5 mV	7.80 ft	200.00 ml/min
9/18/2018 10:39 AM	21:00	6.79 pH	65.92 °F	931.20 µS/cm	0.15 mg/L	0.8 mV	7.80 ft	200.00 ml/min
9/18/2018 10:42 AM	24:00	6.79 pH	66.09 °F	930.41 µS/cm	0.14 mg/L	0.8 mV	7.80 ft	200.00 ml/min
9/18/2018 10:45 AM	27:00	6.78 pH	66.10 °F	928.09 µS/cm	0.15 mg/L	0.7 mV	7.80 ft	200.00 ml/min
9/18/2018 10:48 AM	30:00	6.78 pH	66.04 °F	926.70 µS/cm	0.13 mg/L	0.7 mV	7.80 ft	200.00 ml/min

**Samples**

Sample ID:	Description:
MW-520	Sample time 0955 Final DTW 7.85 ft btoc

# Low-Flow Test Report:

Test Date / Time: 9/18/2018 11:13:17 AM

Project: 3Q18 Edmonds Terminal

Operator Name: EK

<b>Location Name: MW-521</b> <b>Well Diameter: 2 in</b> <b>Casing Type: PVC</b> <b>Screen Length: 10 ft</b> <b>Top of Screen: 3 ft</b> <b>Total Depth: 13 ft</b> <b>Initial Depth to Water: 6.8 ft</b>	<b>Pump Type: Geotech geopump series 2</b> <b>Tubing Type: Polyethylene 0.170 x 1/4"</b> <b>Pump Intake From TOC: 9.5 ft</b> <b>Estimated Total Volume Pumped: 6600 ml</b> <b>Flow Cell Volume: 130 ml</b> <b>Final Flow Rate: 200 ml/min</b> <b>Final Draw Down: 0 ft</b>	<b>Instrument Used: Aqua TROLL 600 Vented</b> <b>Serial Number: 469050</b>
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## Test Notes:

## Weather Conditions:

60 and cloudy

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 15 %		
9/18/2018 11:13 AM	00:00	6.82 pH	64.60 °F	784.78 µS/cm	0.32 mg/L	-12.1 mV	6.80 ft	200.00 ml/min
9/18/2018 11:16 AM	03:00	6.80 pH	64.79 °F	788.49 µS/cm	0.23 mg/L	-7.2 mV	6.80 ft	200.00 ml/min
9/18/2018 11:19 AM	06:00	6.80 pH	65.21 °F	788.96 µS/cm	0.15 mg/L	-3.2 mV	6.80 ft	200.00 ml/min
9/18/2018 11:22 AM	09:00	6.80 pH	65.38 °F	786.11 µS/cm	0.14 mg/L	0.0 mV	6.80 ft	200.00 ml/min
9/18/2018 11:25 AM	12:00	6.79 pH	65.55 °F	786.68 µS/cm	0.08 mg/L	1.4 mV	6.80 ft	200.00 ml/min
9/18/2018 11:28 AM	15:00	6.80 pH	65.46 °F	793.45 µS/cm	0.13 mg/L	2.2 mV	6.80 ft	200.00 ml/min
9/18/2018 11:31 AM	18:00	6.79 pH	65.45 °F	794.56 µS/cm	0.13 mg/L	2.9 mV	6.80 ft	200.00 ml/min
9/18/2018 11:34 AM	21:00	6.79 pH	65.33 °F	778.76 µS/cm	0.12 mg/L	4.2 mV	6.80 ft	200.00 ml/min
9/18/2018 11:37 AM	24:00	6.78 pH	65.88 °F	796.60 µS/cm	0.11 mg/L	6.2 mV	6.80 ft	200.00 ml/min
9/18/2018 11:40 AM	27:00	6.78 pH	66.08 °F	794.50 µS/cm	0.11 mg/L	7.7 mV	6.80 ft	200.00 ml/min
9/18/2018 11:43 AM	30:00	6.78 pH	66.25 °F	798.94 µS/cm	0.10 mg/L	8.4 mV	6.80 ft	200.00 ml/min
9/18/2018 11:46 AM	33:00	6.79 pH	66.32 °F	797.86 µS/cm	0.10 mg/L	8.3 mV	6.80 ft	200.00 ml/min

**Samples**

Sample ID:	Description:
MW-521	Sample time 1050 Final DTW 6.80 ft btoc

# Low-Flow Test Report:

Test Date / Time: 9/17/2018 9:25:36 AM

Project: 3Q18 Edmonds Terminal

Operator Name: EK

<b>Location Name: MW-525</b> <b>Well Diameter: 2 in</b> <b>Casing Type: PVC</b> <b>Screen Length: 10 ft</b> <b>Top of Screen: 3 ft</b> <b>Total Depth: 13 ft</b> <b>Initial Depth to Water: 6.69 ft</b>	<b>Pump Type: Geotech geopump series 2</b> <b>Tubing Type: Polyethylene 0.170 x 1/4"</b> <b>Pump Intake From TOC: 10 ft</b> <b>Estimated Total Volume Pumped: 4800 ml</b> <b>Flow Cell Volume: 130 ml</b> <b>Final Flow Rate: 200 ml/min</b> <b>Final Draw Down: 0.2 ft</b>	<b>Instrument Used: Aqua TROLL 600 Vented</b> <b>Serial Number: 467764</b>
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## Test Notes:

## Weather Conditions:

60 and cloudy

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 15 %		
9/17/2018 9:25 AM	00:00	6.76 pH	58.98 °F	0.00 µS/cm	11.07 mg/L	261.9 mV	6.69 ft	200.00 ml/min
9/17/2018 9:28 AM	03:00	5.66 pH	62.25 °F	1,012.0 µS/cm	0.75 mg/L	-21.3 mV	6.69 ft	200.00 ml/min
9/17/2018 9:31 AM	06:00	5.62 pH	62.52 °F	996.75 µS/cm	0.35 mg/L	-28.3 mV	6.69 ft	200.00 ml/min
9/17/2018 9:34 AM	09:00	5.63 pH	62.60 °F	946.77 µS/cm	0.23 mg/L	-47.4 mV	6.69 ft	200.00 ml/min
9/17/2018 9:37 AM	12:00	5.65 pH	62.80 °F	908.38 µS/cm	0.17 mg/L	-55.4 mV	6.69 ft	200.00 ml/min
9/17/2018 9:40 AM	15:00	5.66 pH	62.77 °F	879.83 µS/cm	0.14 mg/L	-59.5 mV	6.69 ft	200.00 ml/min
9/17/2018 9:43 AM	18:00	5.69 pH	62.60 °F	849.02 µS/cm	0.12 mg/L	-62.8 mV	6.69 ft	200.00 ml/min
9/17/2018 9:46 AM	21:00	5.70 pH	62.50 °F	831.47 µS/cm	0.12 mg/L	-65.6 mV	6.69 ft	200.00 ml/min
9/17/2018 9:49 AM	24:00	5.71 pH	62.47 °F	808.31 µS/cm	0.12 mg/L	-68.5 mV	6.69 ft	200.00 ml/min

## Samples

Sample ID:	Description:
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MW-525

Sample time 0900  
Final DTW 6.89 ft btoc

# Low-Flow Test Report:

Test Date / Time: 9/17/2018 11:20:28 AM

Project: 3Q18 Edmonds Terminal

Operator Name: EK

<b>Location Name: MW-526</b> <b>Well Diameter: 2 in</b> <b>Casing Type: PVC</b> <b>Screen Length: 10 ft</b> <b>Top of Screen: 3 ft</b> <b>Total Depth: 13 ft</b> <b>Initial Depth to Water: 6.01 ft</b>	<b>Pump Type: Geotech geopump series 2</b> <b>Tubing Type: Polyethylene 0.170 x 1/4"</b> <b>Pump Intake From TOC: 9.5 ft</b> <b>Estimated Total Volume Pumped: 5400 ml</b> <b>Flow Cell Volume: 130 ml</b> <b>Final Flow Rate: 200 ml/min</b> <b>Final Draw Down: 0.3 ft</b>	<b>Instrument Used: Aqua TROLL 600 Vented</b> <b>Serial Number: 467764</b>
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## Test Notes:

## Weather Conditions:

65 and cloudy

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 15 %		
9/17/2018 11:20 AM	00:00	6.41 pH	62.40 °F	811.33 µS/cm	0.54 mg/L	-64.1 mV	6.01 ft	200.00 ml/min
9/17/2018 11:23 AM	03:00	6.44 pH	62.46 °F	810.16 µS/cm	0.15 mg/L	-80.8 mV	6.01 ft	200.00 ml/min
9/17/2018 11:26 AM	06:00	6.44 pH	62.58 °F	804.89 µS/cm	0.06 mg/L	-89.9 mV	6.01 ft	200.00 ml/min
9/17/2018 11:29 AM	09:00	6.44 pH	62.79 °F	800.45 µS/cm	0.05 mg/L	-95.5 mV	6.01 ft	200.00 ml/min
9/17/2018 11:32 AM	12:00	6.44 pH	63.04 °F	796.24 µS/cm	0.01 mg/L	-99.8 mV	6.01 ft	200.00 ml/min
9/17/2018 11:35 AM	15:00	6.45 pH	63.17 °F	798.01 µS/cm	0.03 mg/L	-102.1 mV	6.01 ft	200.00 ml/min
9/17/2018 11:38 AM	18:00	6.45 pH	63.26 °F	799.56 µS/cm	0.02 mg/L	-101.9 mV	6.01 ft	200.00 ml/min
9/17/2018 11:41 AM	21:00	6.45 pH	63.44 °F	800.21 µS/cm	0.01 mg/L	-101.8 mV	6.01 ft	200.00 ml/min
9/17/2018 11:44 AM	24:00	6.45 pH	63.49 °F	799.89 µS/cm	0.01 mg/L	-100.5 mV	6.01 ft	200.00 ml/min
9/17/2018 11:47 AM	27:00	6.45 pH	63.59 °F	800.63 µS/cm	0.01 mg/L	-98.8 mV	6.01 ft	200.00 ml/min

## Samples

Sample ID:	Description:
MW-526	Sample time 1050 Final DTW 6.31 ft btoc

Created using VuSitu from In-Situ, Inc.

# Low-Flow Test Report:

Test Date / Time: 9/17/2018 9:30:49 AM

Project: Edmonds Terminal

Operator Name: JI

<b>Location Name: MW-531</b> <b>Well Diameter: 2 in</b> <b>Casing Type: Pvc</b> <b>Screen Length: 10 ft</b> <b>Top of Screen: 3 ft</b> <b>Total Depth: 13 ft</b> <b>Initial Depth to Water: 7.72 ft</b>	<b>Pump Type: Geotecg geo pump series 2</b> <b>Tubing Type: Polyethylene 0.170" x 1/4"</b> <b>Pump Intake From TOC: 10 ft</b> <b>Estimated Total Volume Pumped: 2700 ml</b> <b>Flow Cell Volume: 130 ml</b> <b>Final Flow Rate: 150 ml/min</b> <b>Final Draw Down: 0 ft</b>	<b>Instrument Used: Aqua TROLL 600 Vented</b> <b>Serial Number: 457166</b>
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## Test Notes:

ldtw-7.72

## Weather Conditions:

Overcast 60 degrees

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 15 %		
9/17/2018 9:30 AM	00:00	6.69 pH	61.87 °F	850.25 µS/cm	1.16 mg/L	13.8 mV	7.72 ft	150.00 ml/min
9/17/2018 9:33 AM	03:00	6.64 pH	63.27 °F	814.81 µS/cm	0.26 mg/L	14.6 mV	7.72 ft	150.00 ml/min
9/17/2018 9:36 AM	06:00	6.63 pH	63.75 °F	816.79 µS/cm	0.23 mg/L	22.7 mV	7.72 ft	150.00 ml/min
9/17/2018 9:39 AM	09:00	6.63 pH	64.09 °F	817.18 µS/cm	0.19 mg/L	25.6 mV	7.72 ft	150.00 ml/min
9/17/2018 9:42 AM	12:00	6.62 pH	64.27 °F	804.44 µS/cm	0.14 mg/L	30.0 mV	7.72 ft	150.00 ml/min
9/17/2018 9:45 AM	15:00	6.62 pH	64.51 °F	821.33 µS/cm	0.15 mg/L	31.2 mV	7.72 ft	150.00 ml/min
9/17/2018 9:48 AM	18:00	6.62 pH	64.70 °F	821.92 µS/cm	0.14 mg/L	34.4 mV	7.72 ft	150.00 ml/min

## Samples

Sample ID:	Description:
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MW-531	Sample time- 0855 Fdtw-7.73
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# Low-Flow Test Report:

**Test Date / Time:** 9/17/2018 10:25:55 AM

**Project:** Edmonds Terminal

**Operator Name:** JI

<p><b>Location Name: MW-532</b>  <b>Well Diameter: 2 in</b>  <b>Casing Type: Pvc</b>  <b>Screen Length: 10 ft</b>  <b>Top of Screen: 3 ft</b>  <b>Total Depth: 13 ft</b>  <b>Initial Depth to Water: 7.7 ft</b></p>	<p><b>Pump Type: Geotecg geo pump series 2</b>  <b>Tubing Type: Polyethylene 0.170" x 1/4"</b>  <b>Pump Intake From TOC: 10 ft</b>  <b>Estimated Total Volume Pumped: 6750 ml</b>  <b>Flow Cell Volume: 130 ml</b>  <b>Final Flow Rate: 150 ml/min</b>  <b>Final Draw Down: 0.73 ft</b></p>	<p><b>Instrument Used: Aqua TROLL 600 Vented</b>  <b>Serial Number: 457166</b></p>
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**Test Notes:**

**Weather Conditions:**

Over cast

**Low-Flow Readings:**

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 15 %		
9/17/2018 10:25 AM	00:00	5.69 pH	63.40 °F	551.19 µS/cm	0.63 mg/L	109.5 mV	7.70 ft	150.00 ml/min
9/17/2018 10:28 AM	03:00	5.59 pH	63.30 °F	549.04 µS/cm	0.22 mg/L	106.2 mV	7.70 ft	150.00 ml/min
9/17/2018 10:31 AM	06:00	5.61 pH	63.45 °F	540.33 µS/cm	0.17 mg/L	90.2 mV	7.70 ft	150.00 ml/min
9/17/2018 10:34 AM	09:00	5.62 pH	63.43 °F	554.51 µS/cm	0.15 mg/L	61.5 mV	7.70 ft	150.00 ml/min
9/17/2018 10:37 AM	12:00	5.64 pH	63.32 °F	559.45 µS/cm	0.15 mg/L	39.6 mV	7.70 ft	150.00 ml/min
9/17/2018 10:40 AM	15:00	5.67 pH	63.26 °F	567.24 µS/cm	0.12 mg/L	26.9 mV	7.70 ft	150.00 ml/min
9/17/2018 10:43 AM	18:00	5.74 pH	63.02 °F	557.38 µS/cm	0.14 mg/L	12.9 mV	7.70 ft	150.00 ml/min
9/17/2018 10:46 AM	21:00	5.74 pH	63.10 °F	560.93 µS/cm	0.10 mg/L	15.5 mV	7.70 ft	150.00 ml/min
9/17/2018 10:49 AM	24:00	5.78 pH	63.08 °F	549.85 µS/cm	0.09 mg/L	11.0 mV	7.70 ft	150.00 ml/min
9/17/2018 10:52 AM	27:00	5.83 pH	63.01 °F	546.19 µS/cm	0.09 mg/L	9.7 mV	7.70 ft	150.00 ml/min
9/17/2018 10:55 AM	30:00	5.87 pH	63.00 °F	541.22 µS/cm	0.09 mg/L	4.6 mV	7.70 ft	150.00 ml/min

9/17/2018 10:58 AM	33:00	5.91 pH	62.94 °F	531.12 µS/cm	0.09 mg/L	-1.2 mV	7.70 ft	150.00 ml/min
9/17/2018 11:01 AM	36:00	5.96 pH	62.84 °F	520.71 µS/cm	0.12 mg/L	-5.5 mV	7.70 ft	150.00 ml/min
9/17/2018 11:04 AM	39:00	6.00 pH	62.72 °F	507.93 µS/cm	0.09 mg/L	-7.2 mV	7.70 ft	150.00 ml/min
9/17/2018 11:07 AM	42:00	5.94 pH	63.00 °F	516.61 µS/cm	0.07 mg/L	-2.6 mV	7.70 ft	150.00 ml/min
9/17/2018 11:10 AM	45:00	5.98 pH	62.93 °F	504.11 µS/cm	0.08 mg/L	-11.6 mV	7.70 ft	150.00 ml/min

## Samples

Sample ID:	Description:
MW-532	Fdtw-8.42 Frdo- 0.08 Sample time-1015

# Low-Flow Test Report:

Test Date / Time: 9/17/2018 12:25:08 PM

Project: 3Q18 Edmonds Terminal

Operator Name: EK

<p><b>Location Name: MW-534</b>  <b>Well Diameter: 2 in</b>  <b>Casing Type: PVC</b>  <b>Screen Length: 10 ft</b>  <b>Top of Screen: 3 ft</b>  <b>Total Depth: 13 ft</b>  <b>Initial Depth to Water: 3.91 ft</b></p>	<p><b>Pump Type: Geotech geopump series 2</b>  <b>Tubing Type: Polyethylene 0.170 x 1/4"</b>  <b>Pump Intake From TOC: 7 ft</b>  <b>Estimated Total Volume Pumped: 4200 ml</b>  <b>Flow Cell Volume: 130 ml</b>  <b>Final Flow Rate: 200 ml/min</b>  <b>Final Draw Down: 0.2 ft</b></p>	<p><b>Instrument Used: Aqua TROLL 600 Vented</b>  <b>Serial Number: 467764</b></p>
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## Test Notes:

## Weather Conditions:

65 and cloudy

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 15 %		
9/17/2018 12:25 PM	00:00	6.39 pH	65.42 °F	8,238.5 µS/cm	0.43 mg/L	-74.5 mV	3.91 ft	200.00 ml/min
9/17/2018 12:28 PM	03:00	6.44 pH	65.76 °F	8,292.4 µS/cm	0.09 mg/L	-105.1 mV	3.91 ft	200.00 ml/min
9/17/2018 12:31 PM	06:00	6.46 pH	65.74 °F	8,479.7 µS/cm	0.03 mg/L	-121.8 mV	3.91 ft	200.00 ml/min
9/17/2018 12:34 PM	09:00	6.46 pH	65.57 °F	8,783.7 µS/cm	0.02 mg/L	-132.9 mV	3.91 ft	200.00 ml/min
9/17/2018 12:37 PM	12:00	6.46 pH	65.56 °F	9,200.6 µS/cm	0.01 mg/L	-140.0 mV	3.91 ft	200.00 ml/min
9/17/2018 12:40 PM	15:00	6.46 pH	65.37 °F	9,647.3 µS/cm	0.02 mg/L	-145.4 mV	3.91 ft	200.00 ml/min
9/17/2018 12:43 PM	18:00	6.45 pH	65.44 °F	10,105 µS/cm	0.02 mg/L	-150.0 mV	3.91 ft	200.00 ml/min
9/17/2018 12:46 PM	21:00	6.45 pH	65.44 °F	10,569 µS/cm	0.02 mg/L	-153.5 mV	3.91 ft	200.00 ml/min

## Samples

Sample ID:	Description:
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MW-534

Sample time 1150

Final DTW 4.11 ft btoc

Created using VuSitu from In-Situ, Inc.

# Low-Flow Test Report:

Test Date / Time: 9/17/2018 1:17:21 PM

Project: 3Q18 Edmonds Terminal

Operator Name: EK

<b>Location Name: MW-E-R</b> <b>Well Diameter: 2 in</b> <b>Casing Type: PVC</b> <b>Screen Length: 10 ft</b> <b>Top of Screen: 3 ft</b> <b>Total Depth: 13 ft</b> <b>Initial Depth to Water: 7.4 ft</b>	<b>Pump Type: Geotech geopump series 2</b> <b>Tubing Type: Polyethylene 0.170 x 1/4"</b> <b>Pump Intake From TOC: 10 ft</b> <b>Estimated Total Volume Pumped: 3000 ml</b> <b>Flow Cell Volume: 130 ml</b> <b>Final Flow Rate: 200 ml/min</b> <b>Final Draw Down: 0.45 ft</b>	<b>Instrument Used: Aqua TROLL 600 Vented</b> <b>Serial Number: 467764</b>
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## Test Notes:

## Weather Conditions:

70 and sunny

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 15 %		
9/17/2018 1:17 PM	00:00	6.75 pH	63.19 °F	1,697.3 µS/cm	0.42 mg/L	-119.9 mV	7.40 ft	200.00 ml/min
9/17/2018 1:20 PM	03:00	6.72 pH	63.49 °F	1,618.7 µS/cm	0.05 mg/L	-129.5 mV	7.40 ft	200.00 ml/min
9/17/2018 1:23 PM	06:00	6.70 pH	63.90 °F	1,576.8 µS/cm	0.01 mg/L	-131.9 mV	7.40 ft	200.00 ml/min
9/17/2018 1:26 PM	09:00	6.69 pH	64.15 °F	1,537.7 µS/cm	0.03 mg/L	-133.1 mV	7.40 ft	200.00 ml/min
9/17/2018 1:29 PM	12:00	6.68 pH	64.19 °F	1,502.4 µS/cm	0.03 mg/L	-133.7 mV	7.40 ft	200.00 ml/min
9/17/2018 1:32 PM	15:00	6.67 pH	64.31 °F	1,475.5 µS/cm	0.03 mg/L	-133.6 mV	7.40 ft	200.00 ml/min

## Samples

Sample ID:	Description:
MW-E-R	Sample time 1235 Final DTW 7.85 ft btoc

# Low-Flow Test Report:

Test Date / Time: 11/27/2018 10:13:57 AM

Project: Edmonds terminal 4Q18

Operator Name: EK

<b>Location Name: MW-525</b> <b>Well Diameter: 2 in</b> <b>Casing Type: PVC</b> <b>Screen Length: 10 ft</b> <b>Top of Screen: 3 ft</b> <b>Total Depth: 13 ft</b> <b>Initial Depth to Water: 5.8 ft</b>	<b>Pump Type: Geotech geopump series 2</b> <b>Tubing Type: Polyethylene 0.170 x 1/4"</b> <b>Pump Intake From TOC: 9 ft</b> <b>Estimated Total Volume Pumped: 2400 ml</b> <b>Flow Cell Volume: 130 ml</b> <b>Final Flow Rate: 200 ml/min</b> <b>Final Draw Down: 0.6 ft</b>	<b>Instrument Used: Aqua TROLL 600 Vented</b> <b>Serial Number: 467764</b>
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## Test Notes:

## Weather Conditions:

55 and cloudy

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15 %		
11/27/2018 10:13 AM	00:00	6.71 pH	57.33 °F	125.58 µS/cm	2.21 mg/L		-113.1 mV	5.80 ft	200.00 ml/min
11/27/2018 10:16 AM	03:00	6.61 pH	57.22 °F	143.07 µS/cm	1.80 mg/L		-93.5 mV	5.80 ft	200.00 ml/min
11/27/2018 10:19 AM	06:00	6.51 pH	56.98 °F	145.77 µS/cm	1.69 mg/L		-80.8 mV	5.80 ft	200.00 ml/min
11/27/2018 10:22 AM	09:00	6.40 pH	57.12 °F	151.63 µS/cm	1.60 mg/L		-83.1 mV	5.80 ft	200.00 ml/min
11/27/2018 10:25 AM	12:00	6.35 pH	56.94 °F	152.34 µS/cm	1.50 mg/L		-82.0 mV	5.80 ft	200.00 ml/min

## Samples

Sample ID:	Description:
MW-525	Sample time 1035 Final DTW 6.40 ft btoc Ferrous iron 5.0 mg/L

# Low-Flow Test Report:

Test Date / Time: 11/27/2018 11:03:43 AM

Project: Edmonds terminal 4Q18

Operator Name: EK

<b>Location Name: MW-535</b> <b>Well Diameter: 2 in</b> <b>Casing Type: PVC</b> <b>Screen Length: 10 ft</b> <b>Top of Screen: 3 ft</b> <b>Total Depth: 13 ft</b> <b>Initial Depth to Water: 3.6 ft</b>	<b>Pump Type: Geotech geopump series 2</b> <b>Tubing Type: Polyethylene 0.170 x 1/4"</b> <b>Pump Intake From TOC: 8 ft</b> <b>Estimated Total Volume Pumped: 1800 ml</b> <b>Flow Cell Volume: 130 ml</b> <b>Final Flow Rate: 200 ml/min</b> <b>Final Draw Down: 0 ft</b>	<b>Instrument Used: Aqua TROLL 600 Vented</b> <b>Serial Number: 467764</b>
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## Test Notes:

## Weather Conditions:

55 and cloudy

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15 %		
11/27/2018 11:03 AM	00:00	6.63 pH	53.66 °F	8,100.2 µS/cm	7.09 mg/L		8.1 mV	3.60 ft	200.00 ml/min
11/27/2018 11:06 AM	03:00	6.81 pH	52.91 °F	7,824.1 µS/cm	7.03 mg/L		8.0 mV	3.60 ft	200.00 ml/min
11/27/2018 11:09 AM	06:00	6.90 pH	52.82 °F	8,224.7 µS/cm	7.02 mg/L		7.8 mV	3.60 ft	200.00 ml/min
11/27/2018 11:12 AM	09:00	6.95 pH	53.12 °F	8,102.4 µS/cm	7.06 mg/L		9.0 mV	3.60 ft	200.00 ml/min

## Samples

Sample ID:	Description:
MW-535	Sample time 1120 Final DTW 3.60 ft btoc Ferrous iron 0.0 mg/L

# Low-Flow Test Report:

Test Date / Time: 11/27/2018 8:49:15 AM

Project: Edmonds Terminal 4Q18

Operator Name: KF

<b>Location Name: MW-526</b> <b>Well Diameter: 2 in</b> <b>Casing Type: PVC</b> <b>Screen Length: 10 ft</b> <b>Top of Screen: 3 ft</b> <b>Total Depth: 13 ft</b> <b>Initial Depth to Water: 5.54 m</b>	<b>Pump Type: Geotech geopump Series 2</b> <b>Tubing Type: Polyethylene 0.170" x 1/4"</b> <b>Pump Intake From TOC: 8 ft</b> <b>Estimated Total Volume Pumped: 900 ml</b> <b>Flow Cell Volume: 130 ml</b> <b>Final Flow Rate: 150 ml/min</b> <b>Final Draw Down: 0.25 ft</b>	<b>Instrument Used: Aqua TROLL 600 Vented</b> <b>Serial Number: 565206</b>
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## Test Notes:

## Weather Conditions:

55° F

Mostly cloudy

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15	+/- 10 %	+/- 15 %		
11/27/2018 8:49 AM	00:00	6.91 pH	54.53 °F	309.92 µS/cm	10.00 mg/L		115.5 mV	5.54 m	150.00 ml/min
11/27/2018 8:52 AM	03:00	6.46 pH	54.36 °F	303.66 µS/cm	8.53 mg/L		109.3 mV	5.54 m	150.00 ml/min
11/27/2018 8:55 AM	06:00	6.44 pH	54.44 °F	308.85 µS/cm	8.27 mg/L		108.5 mV	5.54 m	150.00 ml/min

## Samples

Sample ID:	Description:
MW-526	Sample 0900 Final dtw 5.79 ft btoc Ferrous iron 7.0 mg/L

# Low-Flow Test Report:

Test Date / Time: 11/28/2018 8:20:40 AM

Project: Edmonds terminal 4Q18

Operator Name: EK

<b>Location Name: MW-534</b> <b>Well Diameter: 2 in</b> <b>Casing Type: PVC</b> <b>Screen Length: 10 ft</b> <b>Top of Screen: 3 ft</b> <b>Total Depth: 13 ft</b> <b>Initial Depth to Water: 3.35 ft</b>	<b>Pump Type: Geotech geopump series 2</b> <b>Tubing Type: Polyethylene 0.170 x 1/4"</b> <b>Pump Intake From TOC: 8 ft</b> <b>Estimated Total Volume Pumped: 1200 ml</b> <b>Flow Cell Volume: 130 ml</b> <b>Final Flow Rate: 200 ml/min</b> <b>Final Draw Down: 0.15 ft</b>	<b>Instrument Used: Aqua TROLL 600 Vented</b> <b>Serial Number: 467764</b>
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## Test Notes:

## Weather Conditions:

50 and cloudy

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15 %		
11/28/2018 8:20 AM	00:00	6.30 pH	53.40 °F	182.16 µS/cm	3.53 mg/L	29.28 NTU	110.0 mV	3.35 ft	200.00 ml/min
11/28/2018 8:23 AM	03:00	6.43 pH	53.86 °F	185.74 µS/cm	3.42 mg/L	32.82 NTU	109.6 mV	3.35 ft	200.00 ml/min
11/28/2018 8:26 AM	06:00	6.47 pH	53.85 °F	183.11 µS/cm	3.62 mg/L	35.26 NTU	109.1 mV	3.35 ft	200.00 ml/min

## Samples

Sample ID:	Description:
MW-534	Sample time 0830 Final DTW 3.50 ft btoc Ferrous iron 0.0 mg/L
DUP-1	

# Low-Flow Test Report:

Test Date / Time: 11/27/2018 10:12:16 AM

Project: Edmonds Terminal 4Q18

Operator Name: KF

<b>Location Name: MW-532</b> <b>Well Diameter: 2 in</b> <b>Casing Type: PVC</b> <b>Screen Length: 10 ft</b> <b>Top of Screen: 3 ft</b> <b>Total Depth: 13 ft</b> <b>Initial Depth to Water: 6.65 ft</b>	<b>Pump Type: Geotech geopump Series 2</b> <b>Tubing Type: Polyethylene 0.170" x 1/4"</b> <b>Pump Intake From TOC: 8 ft</b> <b>Estimated Total Volume Pumped: 2250 ml</b> <b>Flow Cell Volume: 130 ml</b> <b>Final Flow Rate: 150 ml/min</b> <b>Final Draw Down: 1.1 ft</b>	<b>Instrument Used: Aqua TROLL 600 Vented</b> <b>Serial Number: 565206</b>
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## Test Notes:

## Weather Conditions:

55° F

Partly Cloudy

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15	+/- 10 %	+/- 15 %		
11/27/2018 10:12 AM	00:00	6.69 pH	55.90 °F	252.24 µS/cm	9.06 mg/L	38.37 NTU	126.5 mV	6.65 ft	150.00 ml/min
11/27/2018 10:15 AM	03:00	6.68 pH	55.82 °F	254.07 µS/cm	8.32 mg/L	60.36 NTU	126.6 mV	6.65 ft	150.00 ml/min
11/27/2018 10:18 AM	06:00	6.70 pH	55.65 °F	258.62 µS/cm	8.27 mg/L	14.82 NTU	125.9 mV	6.65 ft	150.00 ml/min
11/27/2018 10:21 AM	09:00	6.67 pH	55.67 °F	258.83 µS/cm	8.23 mg/L	32.23 NTU	126.0 mV	6.65 ft	150.00 ml/min
11/27/2018 10:24 AM	12:00	6.64 pH	55.81 °F	265.71 µS/cm	8.20 mg/L	14.01 NTU	126.6 mV	6.65 ft	150.00 ml/min
11/27/2018 10:27 AM	15:00	6.60 pH	55.89 °F	264.49 µS/cm	8.15 mg/L	17.40 NTU	127.5 mV	6.65 ft	150.00 ml/min

## Samples

Sample ID:	Description:
MW-532	Final DTW: 7.75 Iron: 0.5 mg/L Sample Time: 1030





# Low-Flow Test Report:

**Test Date / Time:** 11/28/2018 9:23:41 AM

**Project:** Edmonds terminal 4Q18

**Operator Name:** EK

<b>Location Name: MW-504</b> <b>Well Diameter: 2 in</b> <b>Casing Type: PVC</b> <b>Screen Length: 10 ft</b> <b>Top of Screen: 3 ft</b> <b>Total Depth: 13 ft</b> <b>Initial Depth to Water: 6.1 ft</b>	<b>Pump Type: Geotech geopump series 2</b> <b>Tubing Type: Polyethylene 0.170 x 1/4"</b> <b>Pump Intake From TOC: 9.5 ft</b> <b>Estimated Total Volume Pumped: 8400 ml</b> <b>Flow Cell Volume: 130 ml</b> <b>Final Flow Rate: 200 ml/min</b> <b>Final Draw Down: 0.1 ft</b>	<b>Instrument Used: Aqua TROLL 600 Vented</b> <b>Serial Number: 467764</b>
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## Test Notes:

## Weather Conditions:

Rain and 50

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15 %		
11/28/2018 9:23 AM	00:00	6.82 pH	54.20 °F	1,092.0 µS/cm	9.29 mg/L	0.00 NTU	45.3 mV	6.10 ft	200.00 ml/min
11/28/2018 9:26 AM	03:00	6.95 pH	54.08 °F	798.19 µS/cm	9.40 mg/L	0.00 NTU	43.2 mV	6.10 ft	200.00 ml/min
11/28/2018 9:29 AM	06:00	6.98 pH	53.98 °F	774.87 µS/cm	9.51 mg/L	0.00 NTU	44.6 mV	6.10 ft	200.00 ml/min
11/28/2018 9:32 AM	09:00	7.01 pH	54.02 °F	708.18 µS/cm	9.54 mg/L	0.00 NTU	44.8 mV	6.10 ft	200.00 ml/min
11/28/2018 9:35 AM	12:00	7.05 pH	54.06 °F	585.70 µS/cm	9.69 mg/L	0.00 NTU	47.2 mV	6.10 ft	200.00 ml/min
11/28/2018 9:38 AM	15:00	7.03 pH	54.05 °F	713.43 µS/cm	9.53 mg/L	0.00 NTU	47.6 mV	6.10 ft	200.00 ml/min
11/28/2018 9:41 AM	18:00	7.05 pH	54.14 °F	716.96 µS/cm	9.51 mg/L	0.21 NTU	45.1 mV	6.10 ft	200.00 ml/min
11/28/2018 9:44 AM	21:00	7.01 pH	54.16 °F	1,707.5 µS/cm	9.38 mg/L	0.65 NTU	44.2 mV	6.10 ft	200.00 ml/min
11/28/2018 9:47 AM	24:00	7.11 pH	54.21 °F	564.93 µS/cm	9.66 mg/L	0.14 NTU	37.3 mV	6.10 ft	200.00 ml/min
11/28/2018 9:50 AM	27:00	7.06 pH	54.15 °F	680.47 µS/cm	9.61 mg/L	0.29 NTU	48.2 mV	6.10 ft	200.00 ml/min
11/28/2018 9:53 AM	30:00	7.04 pH	54.21 °F	791.37 µS/cm	9.54 mg/L	0.59 NTU	45.3 mV	6.10 ft	200.00 ml/min
11/28/2018 9:56 AM	33:00	7.08 pH	54.27 °F	739.56 µS/cm	9.48 mg/L	0.47 NTU	40.7 mV	6.10 ft	200.00 ml/min

11/28/2018 9:59 AM	36:00	7.05 pH	54.30 °F	832.78 µS/cm	9.40 mg/L		41.6 mV	6.10 ft	200.00 ml/min
11/28/2018 10:02 AM	39:00	7.08 pH	54.37 °F	759.12 µS/cm	9.40 mg/L		39.7 mV	6.10 ft	200.00 ml/min
11/28/2018 10:05 AM	42:00	7.06 pH	54.44 °F	839.44 µS/cm	9.20 mg/L		43.2 mV	6.10 ft	200.00 ml/min

## Samples

Sample ID:	Description:
MW-504	Sample time 1010 Final DTW 6.20 ft btoc Ferrous iron 0.0 mg/L

# Low-Flow Test Report:

Test Date / Time: 11/27/2018 10:06:25 AM

Project:

Operator Name: Jason Little

<b>Location Name: MW-531</b> <b>Well Diameter: 2 in</b> <b>Casing Type: Pvc</b> <b>Screen Length: 10 ft</b> <b>Top of Screen: 3 ft</b> <b>Total Depth: 13 ft</b> <b>Initial Depth to Water: 6.64 m</b>	<b>Estimated Total Volume Pumped:</b> <b>1350 ml</b> <b>Flow Cell Volume: 130 ml</b> <b>Final Flow Rate: 150 ml/min</b> <b>Final Draw Down: 0 ft</b>	<b>Instrument Used: Aqua TROLL 600</b> <b>Vented</b> <b>Serial Number: 469050</b>
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## Test Notes:

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15 %		
11/27/2018 10:06 AM	00:00	7.13 pH	52.48 °F	743.08 µS/cm	3.91 mg/L	0.00 NTU	113.9 mV	6.64 m	150.00 ml/min
11/27/2018 10:09 AM	03:00	7.03 pH	52.12 °F	766.32 µS/cm	4.24 mg/L	0.00 NTU	151.9 mV	6.64 m	150.00 ml/min
11/27/2018 10:12 AM	06:00	6.92 pH	51.81 °F	773.39 µS/cm	3.82 mg/L	0.00 NTU	158.7 mV	6.64 m	150.00 ml/min
11/27/2018 10:15 AM	09:00	6.86 pH	51.75 °F	775.20 µS/cm	3.86 mg/L	0.00 NTU	159.5 mV	6.64 m	150.00 ml/min

## Samples

Sample ID:	Description:
MW-531	Sample time-1025 FDTW-6.64 Ferrous iron-0

# Low-Flow Test Report:

**Test Date / Time:** 11/27/2018 11:12:40 AM

**Project:** Edmonds Terminal 4Q18

**Operator Name:** KF

<p><b>Location Name:</b> MW-533  <b>Well Diameter:</b> 2 in  <b>Casing Type:</b> PVC  <b>Screen Length:</b> 10 ft  <b>Top of Screen:</b> 3 ft  <b>Total Depth:</b> 13 ft  <b>Initial Depth to Water:</b> 3.9 ft</p>	<p><b>Pump Type:</b> Geotech geopump Series 2  <b>Tubing Type:</b> Polyethylene 0.170" x 1/4"  <b>Pump Intake From TOC:</b> 8 ft  <b>Estimated Total Volume Pumped:</b> 2250 ml  <b>Flow Cell Volume:</b> 130 ml  <b>Final Flow Rate:</b> 150 ml/min  <b>Final Draw Down:</b> 0 ft</p>	<p><b>Instrument Used:</b> Aqua TROLL 600 Vented  <b>Serial Number:</b> 565206</p>
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## Test Notes:

## Weather Conditions:

56°F

Mostly Sunny

Windy

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15	+/- 10 %	+/- 15 %		
11/27/2018 11:12 AM	00:00	7.01 pH	54.99 °F	2,422.1 µS/cm	6.83 mg/L		120.9 mV	3.90 ft	150.00 ml/min
11/27/2018 11:15 AM	03:00	7.16 pH	53.63 °F	2,612.2 µS/cm	6.48 mg/L		113.4 mV	3.90 ft	150.00 ml/min
11/27/2018 11:18 AM	06:00	7.16 pH	53.38 °F	2,827.3 µS/cm	6.49 mg/L		110.3 mV	3.90 ft	150.00 ml/min
11/27/2018 11:21 AM	09:00	7.16 pH	53.21 °F	3,004.9 µS/cm	6.49 mg/L		108.9 mV	3.90 ft	150.00 ml/min
11/27/2018 11:24 AM	12:00	7.15 pH	53.37 °F	3,167.3 µS/cm	6.48 mg/L		108.8 mV	3.90 ft	150.00 ml/min
11/27/2018 11:27 AM	15:00	7.15 pH	53.47 °F	3,299.6 µS/cm	6.46 mg/L		109.1 mV	3.90 ft	150.00 ml/min

## Samples

Sample ID:	Description:
MW-533	Final DTW: 3.90 Iron: 0 mg/L Sample Time: 1130



# Low-Flow Test Report:

**Test Date / Time:** 11/28/2018 10:37:48 AM

**Project:** Edmonds terminal 4Q18

**Operator Name:** EK

<p><b>Location Name: MW-509</b>  <b>Well Diameter: 2 in</b>  <b>Casing Type: PVC</b>  <b>Screen Length: 10 ft</b>  <b>Top of Screen: 3 ft</b>  <b>Total Depth: 13 ft</b>  <b>Initial Depth to Water: 3.1 ft</b></p>	<p><b>Pump Type: Geotech geopump series 2</b>  <b>Tubing Type: Polyethylene 0.170 x 1/4"</b>  <b>Pump Intake From TOC: 8 ft</b>  <b>Estimated Total Volume Pumped: 3600 ml</b>  <b>Flow Cell Volume: 130 ml</b>  <b>Final Flow Rate: 200 ml/min</b>  <b>Final Draw Down: 0.1 ft</b></p>	<p><b>Instrument Used: Aqua TROLL 600 Vented</b>  <b>Serial Number: 467764</b></p>
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## Test Notes:

## Weather Conditions:

Rain and 50

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15 %		
11/28/2018 10:37 AM	00:00	6.59 pH	56.42 °F	20,479 µS/cm	0.67 mg/L		93.7 mV	3.10 ft	200.00 ml/min
11/28/2018 10:40 AM	03:00	6.74 pH	56.07 °F	13,950 µS/cm	0.22 mg/L		84.5 mV	3.10 ft	200.00 ml/min
11/28/2018 10:43 AM	06:00	6.89 pH	55.64 °F	7,347.1 µS/cm	0.50 mg/L		68.4 mV	3.10 ft	200.00 ml/min
11/28/2018 10:46 AM	09:00	6.92 pH	55.29 °F	4,930.6 µS/cm	1.73 mg/L		68.5 mV	3.10 ft	200.00 ml/min
11/28/2018 10:49 AM	12:00	6.92 pH	55.09 °F	4,338.9 µS/cm	2.71 mg/L		72.1 mV	3.10 ft	200.00 ml/min
11/28/2018 10:52 AM	15:00	6.90 pH	54.98 °F	4,191.6 µS/cm	3.04 mg/L		75.6 mV	3.10 ft	200.00 ml/min
11/28/2018 10:55 AM	18:00	6.89 pH	54.96 °F	4,102.3 µS/cm	3.14 mg/L		78.0 mV	3.10 ft	200.00 ml/min

## Samples

Sample ID:	Description:
MW-509	Sample time 1100 Final DTW 3.20 ft btoc Ferrous iron 0.0 mg/L



# Low-Flow Test Report:

Test Date / Time: 11/27/2018 10:44:41 AM

Project: Edmonds Terminal 4Q18

Operator Name: Jason little

<b>Location Name: MW-104</b> <b>Well Diameter: 2 in</b> <b>Casing Type: Pvc</b> <b>Screen Length: 10 ft</b> <b>Top of Screen: 5 ft</b> <b>Total Depth: 15 ft</b> <b>Initial Depth to Water: 7.23 ft</b>	<b>Pump Type: Geotech geopump series 2</b> <b>Tubing Type: Polyethylene 0.179" x1/4"</b> <b>Pump Intake From TOC: 10 ft</b> <b>Estimated Total Volume Pumped: 3600 ml</b> <b>Flow Cell Volume: 130 ml</b> <b>Final Flow Rate: 150 ml/min</b> <b>Final Draw Down: 0.27 ft</b>	<b>Instrument Used: Aqua TROLL 600 Vented</b> <b>Serial Number: 469050</b>
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## Test Notes:

## Weather Conditions:

Sunny 48

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15 %		
11/27/2018 10:44 AM	00:00	6.73 pH	57.79 °F	624.83 µS/cm	0.23 mg/L	905.71 NTU	-55.6 mV	7.23 ft	150.00 ml/min
11/27/2018 10:47 AM	03:00	6.73 pH	58.12 °F	624.34 µS/cm	0.13 mg/L	1,472.0 NTU	-70.4 mV	7.23 ft	150.00 ml/min
11/27/2018 10:50 AM	06:00	6.72 pH	58.32 °F	622.03 µS/cm	0.09 mg/L	687.86 NTU	-79.7 mV	7.23 ft	150.00 ml/min
11/27/2018 10:53 AM	09:00	6.72 pH	58.44 °F	625.04 µS/cm	0.06 mg/L	0.00 NTU	-87.1 mV	7.23 ft	150.00 ml/min
11/27/2018 10:56 AM	12:00	6.72 pH	58.53 °F	634.92 µS/cm	0.08 mg/L	0.00 NTU	-93.9 mV	7.23 ft	150.00 ml/min
11/27/2018 10:59 AM	15:00	6.72 pH	58.59 °F	640.36 µS/cm	0.06 mg/L	0.00 NTU	-98.2 mV	7.23 ft	150.00 ml/min
11/27/2018 11:02 AM	18:00	6.72 pH	58.68 °F	620.67 µS/cm	0.03 mg/L	0.00 NTU	-102.1 mV	7.23 ft	150.00 ml/min
11/27/2018 11:05 AM	21:00	6.71 pH	58.76 °F	643.82 µS/cm	0.03 mg/L	0.00 NTU	-104.4 mV	7.23 ft	150.00 ml/min
11/27/2018 11:08 AM	24:00	6.71 pH	58.81 °F	632.56 µS/cm	0.02 mg/L	0.00 NTU	-108.7 mV	7.23 ft	150.00 ml/min

## Samples

Sample ID:	Description:
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MW-104	Sample -1115 DTW-7.59 Ferrous iron-3.5
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# Low-Flow Test Report:

**Test Date / Time:** 11/28/2018 11:37:15 AM

**Project:** Edmonds terminal 4Q18

**Operator Name:** EK

<p><b>Location Name: MW-518</b>  <b>Well Diameter: 2 in</b>  <b>Casing Type: PVC</b>  <b>Screen Length: 10 ft</b>  <b>Top of Screen: 2.5 ft</b>  <b>Total Depth: 12.5 ft</b>  <b>Initial Depth to Water: 7.5 ft</b></p>	<p><b>Pump Type: Geotech geopump series 2</b>  <b>Tubing Type: Polyethylene 0.170 x 1/4"</b>  <b>Pump Intake From TOC: 10 ft</b>  <b>Estimated Total Volume Pumped: 5400 ml</b>  <b>Flow Cell Volume: 130 ml</b>  <b>Final Flow Rate: 200 ml/min</b>  <b>Final Draw Down: 0.05 ft</b></p>	<p><b>Instrument Used: Aqua TROLL 600 Vented</b>  <b>Serial Number: 467764</b></p>
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## Test Notes:

## Weather Conditions:

Rain and 50

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15 %		
11/28/2018 11:37 AM	00:00	6.76 pH	57.96 °F	1,068.5 µS/cm	0.54 mg/L	5.08 NTU	-56.1 mV	7.50 ft	200.00 ml/min
11/28/2018 11:40 AM	03:00	6.80 pH	58.13 °F	1,064.8 µS/cm	0.39 mg/L	0.00 NTU	-67.9 mV	7.50 ft	200.00 ml/min
11/28/2018 11:43 AM	06:00	6.80 pH	58.20 °F	1,059.3 µS/cm	0.30 mg/L	0.24 NTU	-73.9 mV	7.50 ft	200.00 ml/min
11/28/2018 11:46 AM	09:00	6.80 pH	58.31 °F	1,059.4 µS/cm	0.25 mg/L	0.65 NTU	-77.5 mV	7.50 ft	200.00 ml/min
11/28/2018 11:49 AM	12:00	6.80 pH	58.30 °F	1,054.9 µS/cm	0.22 mg/L	0.73 NTU	-79.4 mV	7.50 ft	200.00 ml/min
11/28/2018 11:52 AM	15:00	6.81 pH	58.36 °F	1,060.0 µS/cm	0.18 mg/L	0.93 NTU	-82.6 mV	7.50 ft	200.00 ml/min
11/28/2018 11:55 AM	18:00	6.81 pH	58.41 °F	1,059.8 µS/cm	0.16 mg/L	1.28 NTU	-84.7 mV	7.50 ft	200.00 ml/min
11/28/2018 11:58 AM	21:00	6.81 pH	58.46 °F	1,056.3 µS/cm	0.15 mg/L	1.22 NTU	-86.6 mV	7.50 ft	200.00 ml/min
11/28/2018 12:01 PM	24:00	6.81 pH	58.48 °F	1,055.8 µS/cm	0.14 mg/L	1.65 NTU	-88.2 mV	7.50 ft	200.00 ml/min
11/28/2018 12:04 PM	27:00	6.81 pH	58.46 °F	1,055.6 µS/cm	0.14 mg/L	1.41 NTU	-87.4 mV	7.50 ft	200.00 ml/min

**Samples**

Sample ID:	Description:
MW-518	Sample time 1205 Final DTW 7.55 ft btoc Ferrous iron 4.0 mg/L

# Low-Flow Test Report:

Test Date / Time: 11/27/2018 11:40:52 AM

Project: Edmonds Terminal 4Q18

Operator Name: Jason little

<b>Location Name: MW-E-R</b> <b>Well Diameter: 2 in</b> <b>Casing Type: Pvc</b> <b>Screen Length: 10 ft</b> <b>Top of Screen: 3 ft</b> <b>Total Depth: 13 ft</b> <b>Initial Depth to Water: 6.7 ft</b>	<b>Pump Type: Geotech geopump series 2</b> <b>Tubing Type: Polyethylene 0.179" x1/4"</b> <b>Pump Intake From TOC: 9.5 ft</b> <b>Estimated Total Volume Pumped: 6750 ml</b> <b>Flow Cell Volume: 130 ml</b> <b>Final Flow Rate: 150 ml/min</b> <b>Final Draw Down: 0.52 ft</b>	<b>Instrument Used: Aqua TROLL 600 Vented</b> <b>Serial Number: 469050</b>
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## Test Notes:

## Weather Conditions:

Sunny 48

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15 %		
11/27/2018 11:40 AM	00:00	6.65 pH	61.05 °F	1,173.5 µS/cm	3.69 mg/L	1,841.4 NTU	-56.0 mV	6.70 ft	150.00 ml/min
11/27/2018 11:43 AM	03:00	6.66 pH	59.77 °F	1,195.1 µS/cm	0.11 mg/L	4,454.7 NTU	-91.1 mV	6.70 ft	150.00 ml/min
11/27/2018 11:46 AM	06:00	6.67 pH	59.67 °F	1,193.2 µS/cm	0.07 mg/L	3,795.5 NTU	-98.2 mV	6.70 ft	150.00 ml/min
11/27/2018 11:49 AM	09:00	6.67 pH	59.61 °F	1,199.2 µS/cm	0.08 mg/L	926.46 NTU	-98.6 mV	6.70 ft	150.00 ml/min
11/27/2018 11:52 AM	12:00	6.68 pH	59.65 °F	1,202.1 µS/cm	0.06 mg/L	0.00 NTU	-102.1 mV	6.70 ft	150.00 ml/min
11/27/2018 11:55 AM	15:00	6.68 pH	59.57 °F	1,172.9 µS/cm	0.06 mg/L	0.00 NTU	-103.9 mV	6.70 ft	150.00 ml/min
11/27/2018 11:58 AM	18:00	6.67 pH	59.61 °F	1,203.1 µS/cm	0.05 mg/L	0.00 NTU	-106.0 mV	6.70 ft	150.00 ml/min
11/27/2018 12:01 PM	21:00	6.67 pH	59.64 °F	1,224.1 µS/cm	0.09 mg/L	0.00 NTU	-106.8 mV	6.70 ft	150.00 ml/min
11/27/2018 12:04 PM	24:00	6.68 pH	59.72 °F	1,235.5 µS/cm	0.17 mg/L	0.00 NTU	-104.2 mV	6.70 ft	150.00 ml/min
11/27/2018 12:07 PM	27:00	6.68 pH	59.84 °F	1,262.9 µS/cm	0.12 mg/L	0.00 NTU	-105.3 mV	6.70 ft	150.00 ml/min
11/27/2018 12:10 PM	30:00	6.69 pH	59.87 °F	1,258.7 µS/cm	0.14 mg/L	0.00 NTU	-99.9 mV	6.70 ft	150.00 ml/min
11/27/2018 12:13 PM	33:00	6.69 pH	59.95 °F	1,275.5 µS/cm	0.15 mg/L	0.00 NTU	-93.6 mV	6.70 ft	150.00 ml/min

11/27/2018 12:16 PM	36:00	6.69 pH	59.98 °F	1,274.7 μS/cm	0.15 mg/L	0.00 NTU	-106.4 mV	6.70 ft	150.00 ml/min
11/27/2018 12:19 PM	39:00	6.70 pH	60.03 °F	1,288.8 μS/cm	0.27 mg/L	537.87 NTU	-102.3 mV	6.70 ft	150.00 ml/min
11/27/2018 12:22 PM	42:00	6.70 pH	59.95 °F	978.19 μS/cm	0.28 mg/L	2,915.7 NTU	-100.7 mV	6.70 ft	150.00 ml/min
11/27/2018 12:25 PM	45:00	6.76 pH	60.04 °F	1,087.9 μS/cm	1.63 mg/L	0.00 NTU	-87.7 mV	6.70 ft	150.00 ml/min

## Samples

Sample ID:	Description:
MW-E-R	Sample time-1235 Fdtw-7.22 Ferrous iron-7.0 mg/l

# Low-Flow Test Report:

Test Date / Time: 11/27/2018 1:26:43 PM

Project: Edmonds Terminal 4Q18

Operator Name: KF

<b>Location Name: MW-530</b> <b>Well Diameter: 1 in</b> <b>Casing Type: PVC</b> <b>Screen Length: 5 ft</b> <b>Top of Screen: 3 ft</b> <b>Total Depth: 8 ft</b> <b>Initial Depth to Water: 3.6 ft</b>	<b>Pump Type: Geotech geopump Series 2</b> <b>Tubing Type: Polyethylene 0.170" x 1/4"</b> <b>Pump Intake From TOC: 5 ft</b> <b>Estimated Total Volume Pumped: 1350 ml</b> <b>Flow Cell Volume: 130 ml</b> <b>Final Flow Rate: 150 ml/min</b> <b>Final Draw Down: 1.07 ft</b>	<b>Instrument Used: Aqua TROLL 600 Vented</b> <b>Serial Number: 565206</b>
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## Test Notes:

## Weather Conditions:

Mostly cloudy

57°F

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15	+/- 10 %	+/- 15 %		
11/27/2018 1:26 PM	00:00	6.58 pH	54.31 °F	18,838 µS/cm	2.24 mg/L	13.97 NTU	-196.8 mV	3.60 ft	150.00 ml/min
11/27/2018 1:29 PM	03:00	6.56 pH	52.82 °F	26,473 µS/cm	0.24 mg/L	0.00 NTU	-278.6 mV	3.60 ft	150.00 ml/min
11/27/2018 1:32 PM	06:00	6.57 pH	52.47 °F	25,642 µS/cm	0.15 mg/L	0.00 NTU	-279.5 mV	3.60 ft	150.00 ml/min
11/27/2018 1:35 PM	09:00	6.59 pH	52.27 °F	24,312 µS/cm	0.10 mg/L	1.94 NTU	-280.4 mV	3.60 ft	150.00 ml/min

## Samples

Sample ID:	Description:
MW-530	Final DTW: 4.67 Iron: 0.5 mg/L Sample Time: 1340

# Low-Flow Test Report:

**Test Date / Time:** 11/27/2018 1:56:06 PM

**Project:** Edmonds Terminal 4Q18

**Operator Name:** Jason little

<p><b>Location Name: LM-2</b>  <b>Well Diameter: 2 in</b>  <b>Casing Type: Pvc</b>  <b>Screen Length: 5.5 ft</b>  <b>Top of Screen: 2.5 ft</b>  <b>Total Depth: 8 ft</b>  <b>Initial Depth to Water: 2.25 ft</b></p>	<p><b>Pump Type: Geotech geopump series 2</b>  <b>Tubing Type: Polyethylene 0.179" x1/4"</b>  <b>Pump Intake From TOC: 4.5 ft</b>  <b>Estimated Total Volume Pumped: 3600 ml</b>  <b>Flow Cell Volume: 130 ml</b>  <b>Final Flow Rate: 150 ml/min</b>  <b>Final Draw Down: 0.27 ft</b></p>	<p><b>Instrument Used: Aqua TROLL 600 Vented</b>  <b>Serial Number: 469050</b></p>
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## Test Notes:

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15 %		
11/27/2018 1:56 PM	00:00	6.01 pH	56.53 °F	3,397.2 µS/cm	0.09 mg/L	8,047.8 NTU	-34.3 mV	2.25 ft	150.00 ml/min
11/27/2018 1:59 PM	03:00	5.96 pH	56.28 °F	3,457.6 µS/cm	0.03 mg/L	16,570 NTU	-51.7 mV	2.25 ft	150.00 ml/min
11/27/2018 2:02 PM	06:00	5.94 pH	56.10 °F	3,491.9 µS/cm	0.03 mg/L	29,630 NTU	-61.2 mV	2.25 ft	150.00 ml/min
11/27/2018 2:05 PM	09:00	5.94 pH	56.08 °F	4,183.4 µS/cm	0.03 mg/L	36,532 NTU	-69.0 mV	2.25 ft	150.00 ml/min
11/27/2018 2:08 PM	12:00	5.95 pH	56.01 °F	4,283.7 µS/cm	0.03 mg/L	10,209 NTU	-76.8 mV	2.25 ft	150.00 ml/min
11/27/2018 2:11 PM	15:00	5.97 pH	55.98 °F	4,378.2 µS/cm	0.02 mg/L	5,867.0 NTU	-85.2 mV	2.25 ft	150.00 ml/min
11/27/2018 2:14 PM	18:00	5.98 pH	55.94 °F	4,419.9 µS/cm	0.01 mg/L	4,235.7 NTU	-91.2 mV	2.25 ft	150.00 ml/min
11/27/2018 2:17 PM	21:00	5.99 pH	55.95 °F	4,455.9 µS/cm	0.01 mg/L	3,944.8 NTU	-96.5 mV	2.25 ft	150.00 ml/min
11/27/2018 2:20 PM	24:00	6.02 pH	55.99 °F	4,512.3 µS/cm	0.01 mg/L	864.92 NTU	-101.5 mV	2.25 ft	150.00 ml/min

## Samples

Sample ID:	Description:
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LM-2	Sample time-1425 FdTW-2.52 Ferrous iron-7.0 mg/l
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# Low-Flow Test Report:

Test Date / Time: 11/28/2018 8:23:40 AM

Project: Edmonds Terminal 4Q18

Operator Name: KF

<b>Location Name: MW-507</b> <b>Well Diameter: 2 in</b> <b>Casing Type: PVC</b> <b>Screen Length: 10 ft</b> <b>Top of Screen: 3 ft</b> <b>Total Depth: 13 ft</b> <b>Initial Depth to Water: 6.38 ft</b>	<b>Pump Type: Geotech geopump Series 2</b> <b>Tubing Type: Polyethylene 0.170" x 1/4"</b> <b>Pump Intake From TOC: 5 ft</b> <b>Estimated Total Volume Pumped: 1800 ml</b> <b>Flow Cell Volume: 130 ml</b> <b>Final Flow Rate: 150 ml/min</b> <b>Final Draw Down: 0 ft</b>	<b>Instrument Used: Aqua TROLL 600 Vented</b> <b>Serial Number: 565206</b>
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## Test Notes:

## Weather Conditions:

Overcast

48°F

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15	+/- 10 %	+/- 15 %		
11/28/2018 8:23 AM	00:00	6.64 pH	53.92 °F	811.41 µS/cm	7.21 mg/L	20.33 NTU	132.3 mV	6.38 ft	150.00 ml/min
11/28/2018 8:26 AM	03:00	6.81 pH	55.24 °F	331.36 µS/cm	6.67 mg/L	8.11 NTU	124.9 mV	6.38 ft	150.00 ml/min
11/28/2018 8:29 AM	06:00	6.82 pH	55.83 °F	780.03 µS/cm	6.36 mg/L	33.04 NTU	128.7 mV	6.38 ft	150.00 ml/min
11/28/2018 8:32 AM	09:00	6.81 pH	56.18 °F	780.46 µS/cm	5.93 mg/L	1.94 NTU	128.5 mV	6.38 ft	150.00 ml/min
11/28/2018 8:35 AM	12:00	6.81 pH	56.47 °F	782.13 µS/cm	5.82 mg/L	0.30 NTU	130.4 mV	6.38 ft	150.00 ml/min

## Samples

Sample ID:	Description:
MW-507	Final DTW: 6.69 Iron: 0.5 Sample Time: 0835 MS/MSD taken



# Low-Flow Test Report:

**Test Date / Time:** 11/28/2018 8:22:29 AM

**Project:** Edmonds Terminal 4Q18

**Operator Name:** Jason little

<p><b>Location Name: MW-129R</b>  <b>Well Diameter: 2 in</b>  <b>Casing Type: Pvc</b>  <b>Screen Length: 10 ft</b>  <b>Top of Screen: 3 ft</b>  <b>Total Depth: 13 ft</b>  <b>Initial Depth to Water: 5.49 ft</b></p>	<p><b>Pump Type: Geotech geopump series 2</b>  <b>Tubing Type: Polyethylene 0.179" x1/4"</b>  <b>Pump Intake From TOC: 8.5 ft</b>  <b>Estimated Total Volume Pumped: 2700 ml</b>  <b>Flow Cell Volume: 130 ml</b>  <b>Final Flow Rate: 150 ml/min</b>  <b>Final Draw Down: 1 ft</b></p>	<p><b>Instrument Used: Aqua TROLL 600 Vented</b>  <b>Serial Number: 469050</b></p>
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## Test Notes:

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15 %		
11/28/2018 8:22 AM	00:00	6.82 pH	54.39 °F	1,261.0 µS/cm	0.77 mg/L	128.34 NTU	-59.3 mV	5.49 ft	150.00 ml/min
11/28/2018 8:25 AM	03:00	6.83 pH	54.38 °F	1,260.7 µS/cm	0.17 mg/L	0.00 NTU	-79.3 mV	5.49 ft	150.00 ml/min
11/28/2018 8:28 AM	06:00	6.84 pH	54.27 °F	1,275.5 µS/cm	0.21 mg/L	0.00 NTU	-97.3 mV	5.49 ft	150.00 ml/min
11/28/2018 8:31 AM	09:00	6.84 pH	54.23 °F	1,283.5 µS/cm	0.10 mg/L	0.00 NTU	-112.9 mV	5.49 ft	150.00 ml/min
11/28/2018 8:34 AM	12:00	6.84 pH	54.29 °F	1,283.5 µS/cm	0.07 mg/L	0.00 NTU	-125.9 mV	5.49 ft	150.00 ml/min
11/28/2018 8:37 AM	15:00	6.85 pH	54.27 °F	1,291.5 µS/cm	0.06 mg/L	0.00 NTU	-128.4 mV	5.49 ft	150.00 ml/min
11/28/2018 8:40 AM	18:00	6.85 pH	54.32 °F	1,297.4 µS/cm	0.06 mg/L	0.00 NTU	-127.7 mV	5.49 ft	150.00 ml/min

## Samples

Sample ID:	Description:
MW-129-R	Sample time-0845 Ferrous iron-7.0 Final DTW-6.50

# Low-Flow Test Report:

**Test Date / Time:** 11/28/2018 9:45:19 AM

**Project:** Edmonds Terminal 4Q18

**Operator Name:** KF

<p><b>Location Name: MW-506</b>  <b>Well Diameter: 2 in</b>  <b>Casing Type: PVC</b>  <b>Screen Length: 10 ft</b>  <b>Top of Screen: 3 ft</b>  <b>Total Depth: 13 ft</b>  <b>Initial Depth to Water: 6.15 ft</b></p>	<p><b>Pump Type: Geotech geopump Series 2</b>  <b>Tubing Type: Polyethylene 0.170" x 1/4"</b>  <b>Pump Intake From TOC: 8 ft</b>  <b>Estimated Total Volume Pumped: 7107.5 ml</b>  <b>Flow Cell Volume: 130 ml</b>  <b>Final Flow Rate: 150 ml/min</b>  <b>Final Draw Down: 0.11 ft</b></p>	<p><b>Instrument Used: Aqua TROLL 600 Vented</b>  <b>Serial Number: 565206</b></p>
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## Test Notes:

## Weather Conditions:

Overcast

Rain

50° F

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15 %		
11/28/2018 9:45 AM	00:00	7.08 pH	55.91 °F	539.46 µS/cm	5.20 mg/L	10.24 NTU	116.3 mV	6.15 ft	150.00 ml/min
11/28/2018 9:48 AM	03:00	7.04 pH	56.63 °F	534.67 µS/cm	1.64 mg/L	7.41 NTU	105.9 mV	6.15 ft	150.00 ml/min
11/28/2018 9:50 AM	05:23	7.04 pH	56.65 °F	530.68 µS/cm	1.85 mg/L	3.77 NTU	82.3 mV	6.15 ft	150.00 ml/min
11/28/2018 9:53 AM	08:23	7.02 pH	56.79 °F	534.55 µS/cm	1.53 mg/L	1.57 NTU	57.5 mV	6.15 ft	150.00 ml/min
11/28/2018 9:56 AM	11:23	7.01 pH	56.88 °F	533.56 µS/cm	1.40 mg/L	0.39 NTU	42.2 mV	6.15 ft	150.00 ml/min
11/28/2018 9:59 AM	14:23	6.99 pH	56.88 °F	541.56 µS/cm	1.34 mg/L	0.45 NTU	29.2 mV	6.15 ft	150.00 ml/min
11/28/2018 10:02 AM	17:23	6.98 pH	56.93 °F	545.13 µS/cm	1.29 mg/L	0.00 NTU	20.5 mV	6.15 ft	150.00 ml/min
11/28/2018 10:05 AM	20:23	6.95 pH	56.98 °F	552.44 µS/cm	1.17 mg/L	0.00 NTU	9.5 mV	6.15 ft	150.00 ml/min
11/28/2018 10:08 AM	23:23	6.94 pH	56.98 °F	555.56 µS/cm	1.00 mg/L	6.81 NTU	-7.5 mV	6.15 ft	150.00 ml/min
11/28/2018 10:11 AM	26:23	6.90 pH	56.97 °F	566.51 µS/cm	0.76 mg/L	0.00 NTU	-17.9 mV	6.15 ft	150.00 ml/min
11/28/2018 10:14 AM	29:23	6.90 pH	57.02 °F	563.80 µS/cm	0.74 mg/L	0.00 NTU	-25.4 mV	6.15 ft	150.00 ml/min

11/28/2018 10:17 AM	32:23	6.89 pH	57.01 °F	574.75 µS/cm	0.88 mg/L	0.00 NTU	-29.9 mV	6.15 ft	150.00 ml/min
11/28/2018 10:20 AM	35:23	6.89 pH	57.03 °F	612.95 µS/cm	0.75 mg/L	0.00 NTU	-35.9 mV	6.15 ft	150.00 ml/min
11/28/2018 10:23 AM	38:23	6.88 pH	57.05 °F	578.90 µS/cm	0.83 mg/L	0.00 NTU	-41.7 mV	6.15 ft	150.00 ml/min
11/28/2018 10:26 AM	41:23	6.89 pH	57.02 °F	613.67 µS/cm	0.93 mg/L	0.55 NTU	-41.8 mV	6.15 ft	150.00 ml/min
11/28/2018 10:29 AM	44:23	6.88 pH	57.02 °F	579.70 µS/cm	0.98 mg/L	0.00 NTU	-47.1 mV	6.15 ft	150.00 ml/min
11/28/2018 10:32 AM	47:23	6.86 pH	57.09 °F	587.37 µS/cm	0.57 mg/L	0.00 NTU	-54.5 mV	6.15 ft	150.00 ml/min

## Samples

Sample ID:	Description:
MW-506	DO and ORP did not stabilize Final DTW: 6.26 Iron: 3.0 mg/L Sample Time: 1030

# Low-Flow Test Report:

**Test Date / Time:** 11/28/2018 9:22:28 AM

**Project:** Edmonds Terminal 4Q18

**Operator Name:** Jason little

<p><b>Location Name: MW-503</b>  <b>Well Diameter: 2 in</b>  <b>Casing Type: Pvc</b>  <b>Screen Length: 10 ft</b>  <b>Top of Screen: 3 ft</b>  <b>Total Depth: 13 ft</b>  <b>Initial Depth to Water: 4.71 ft</b></p>	<p><b>Pump Type: Geotech geopump series 2</b>  <b>Tubing Type: Polyethylene 0.179" x1/4"</b>  <b>Pump Intake From TOC: 8 ft</b>  <b>Estimated Total Volume Pumped: 4242.5 ml</b>  <b>Flow Cell Volume: 130 ml</b>  <b>Final Flow Rate: 150 ml/min</b>  <b>Final Draw Down: 0.24 ft</b></p>	<p><b>Instrument Used: Aqua TROLL 600 Vented</b>  <b>Serial Number: 469050</b></p>
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## Test Notes:

## Weather Conditions:

Rain

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15 %		
11/28/2018 9:22 AM	00:00	6.65 pH	57.55 °F	497.02 µS/cm	0.32 mg/L	13,677 NTU	-71.9 mV	4.71 ft	150.00 ml/min
11/28/2018 9:25 AM	03:00	6.58 pH	58.22 °F	493.81 µS/cm	0.12 mg/L	0.00 NTU	-115.2 mV	4.71 ft	150.00 ml/min
11/28/2018 9:28 AM	06:00	6.55 pH	58.30 °F	493.17 µS/cm	0.08 mg/L	0.00 NTU	-116.0 mV	4.71 ft	150.00 ml/min
11/28/2018 9:31 AM	09:00	6.53 pH	58.47 °F	491.40 µS/cm	0.05 mg/L	2,654.6 NTU	-109.3 mV	4.71 ft	150.00 ml/min
11/28/2018 9:34 AM	12:00	6.53 pH	58.58 °F	493.15 µS/cm	0.04 mg/L	0.00 NTU	-102.8 mV	4.71 ft	150.00 ml/min
11/28/2018 9:37 AM	15:00	6.52 pH	58.76 °F	497.51 µS/cm	0.03 mg/L	223.88 NTU	-104.7 mV	4.71 ft	150.00 ml/min
11/28/2018 9:40 AM	18:00	6.51 pH	58.87 °F	497.16 µS/cm	0.02 mg/L	1,191.9 NTU	-100.4 mV	4.71 ft	150.00 ml/min
11/28/2018 9:44 AM	22:17	6.50 pH	58.90 °F	494.37 µS/cm	0.03 mg/L	1,115.0 NTU	-100.7 mV	4.71 ft	150.00 ml/min
11/28/2018 9:47 AM	25:17	6.50 pH	58.84 °F	492.67 µS/cm	0.03 mg/L	353.92 NTU	-96.5 mV	4.71 ft	150.00 ml/min
11/28/2018 9:50 AM	28:17	6.51 pH	58.90 °F	492.76 µS/cm	0.03 mg/L	367.49 NTU	-90.4 mV	4.71 ft	150.00 ml/min

**Samples**

Sample ID:	Description:
MW-503	Sample time-0955 Fdtw-4.95 Ferrous iron-5.5mg/l

# Low-Flow Test Report:

**Test Date / Time:** 11/29/2018 9:28:13 AM

**Project:** Edmonds Terminal 4Q18

**Operator Name:** EK

<p><b>Location Name: MW-517</b>  <b>Well Diameter: 2 in</b>  <b>Casing Type: PVC</b>  <b>Screen Length: 10 ft</b>  <b>Top of Screen: 3 ft</b>  <b>Total Depth: 13 ft</b>  <b>Initial Depth to Water: 4.85 ft</b></p>	<p><b>Pump Type: Geotech geopump series 2</b>  <b>Tubing Type: Polyethylene 0.170 x 1/4"</b>  <b>Pump Intake From TOC: 8.5 ft</b>  <b>Estimated Total Volume Pumped: 6600 ml</b>  <b>Flow Cell Volume: 130 ml</b>  <b>Final Flow Rate: 200 ml/min</b>  <b>Final Draw Down: 0.05 ft</b></p>	<p><b>Instrument Used: Aqua TROLL 600 Vented</b>  <b>Serial Number: 467764</b></p>
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## Test Notes:

## Weather Conditions:

50 and cloudy

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15 %		
11/29/2018 9:28 AM	00:00	6.65 pH	52.94 °F	474.08 µS/cm	4.68 mg/L		146.8 mV	4.85 ft	200.00 ml/min
11/29/2018 9:31 AM	03:00	6.80 pH	53.59 °F	456.44 µS/cm	4.48 mg/L	2.78 NTU	139.4 mV	4.85 ft	200.00 ml/min
11/29/2018 9:34 AM	06:00	6.85 pH	54.36 °F	537.56 µS/cm	4.37 mg/L	1.18 NTU	135.7 mV	4.85 ft	200.00 ml/min
11/29/2018 9:37 AM	09:00	6.85 pH	54.59 °F	532.60 µS/cm	4.20 mg/L	0.89 NTU	132.8 mV	4.85 ft	200.00 ml/min
11/29/2018 9:40 AM	12:00	6.86 pH	54.71 °F	506.69 µS/cm	3.37 mg/L	2.11 NTU	129.8 mV	4.85 ft	200.00 ml/min
11/29/2018 9:43 AM	15:00	6.90 pH	54.57 °F	443.90 µS/cm	3.25 mg/L	2.05 NTU	127.3 mV	4.85 ft	200.00 ml/min
11/29/2018 9:46 AM	18:00	6.91 pH	54.45 °F	427.46 µS/cm	3.69 mg/L	2.44 NTU	125.6 mV	4.85 ft	200.00 ml/min
11/29/2018 9:49 AM	21:00	6.88 pH	54.56 °F	477.04 µS/cm	3.86 mg/L	2.60 NTU	124.0 mV	4.85 ft	200.00 ml/min
11/29/2018 9:52 AM	24:00	6.89 pH	54.55 °F	462.92 µS/cm	3.95 mg/L	2.71 NTU	123.4 mV	4.85 ft	200.00 ml/min
11/29/2018 9:55 AM	27:00	6.94 pH	54.52 °F	403.42 µS/cm	3.77 mg/L	2.87 NTU	120.0 mV	4.85 ft	200.00 ml/min
11/29/2018 9:58 AM	30:00	6.92 pH	54.55 °F	431.02 µS/cm	4.39 mg/L	2.75 NTU	118.7 mV	4.85 ft	200.00 ml/min
11/29/2018 10:01 PM	33:00	6.93 pH	54.54 °F	415.38 µS/cm	4.11 mg/L	2.89 NTU	117.8 mV	4.85 ft	200.00 ml/min



**Samples**

Sample ID:	Description:
MW-517	Sample time 1000 Final DTW 4.90 ft btoc Ferrous iron 0.0 mg/L
MW-517 MS/MSD	

# Low-Flow Test Report:

Test Date / Time: 11/28/2018 11:06:50 AM

Project: Edmonds Terminal 4Q18

Operator Name: KF

<b>Location Name: MW-502</b> <b>Well Diameter: 2 in</b> <b>Casing Type: PVC</b> <b>Screen Length: 10 ft</b> <b>Top of Screen: 3 ft</b> <b>Total Depth: 13 ft</b> <b>Initial Depth to Water: 5.27 ft</b>	<b>Pump Type: Geotech geopump Series 2</b> <b>Tubing Type: Polyethylene 0.170" x 1/4"</b> <b>Pump Intake From TOC: 8 ft</b> <b>Estimated Total Volume Pumped: 2250 ml</b> <b>Flow Cell Volume: 130 ml</b> <b>Final Flow Rate: 150 ml/min</b> <b>Final Draw Down: 0.34 ft</b>	<b>Instrument Used: Aqua TROLL 600 Vented</b> <b>Serial Number: 565206</b>
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## Test Notes:

## Weather Conditions:

Overcast

Rain

50°F

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15 %		
11/28/2018 11:06 AM	00:00	6.50 pH	55.08 °F	268.66 µS/cm	4.14 mg/L	320.36 NTU	74.1 mV	5.27 ft	150.00 ml/min
11/28/2018 11:09 AM	03:00	6.26 pH	54.40 °F	272.56 µS/cm	0.33 mg/L	53.62 NTU	89.8 mV	5.27 ft	150.00 ml/min
11/28/2018 11:12 AM	06:00	6.22 pH	54.17 °F	274.16 µS/cm	0.32 mg/L	60.81 NTU	96.3 mV	5.27 ft	150.00 ml/min
11/28/2018 11:15 AM	09:00	6.27 pH	54.34 °F	261.98 µS/cm	0.20 mg/L	7.00 NTU	94.9 mV	5.27 ft	150.00 ml/min
11/28/2018 11:18 AM	12:00	6.26 pH	54.27 °F	268.10 µS/cm	0.19 mg/L	6.03 NTU	91.0 mV	5.27 ft	150.00 ml/min
11/28/2018 11:21 AM	15:00	6.25 pH	54.31 °F	260.71 µS/cm	0.18 mg/L	4.16 NTU	92.1 mV	5.27 ft	150.00 ml/min

## Samples

Sample ID:	Description:
MW-502	Final DTW: 5.61 Iron: 1.5 mg/L Sample Time: 1130



# Low-Flow Test Report:

**Test Date / Time:** 11/28/2018 12:27:08 AM

**Project:** Edmonds Terminal 4Q18

**Operator Name:** Jason little

<p><b>Location Name: MW-505</b>  <b>Well Diameter: 2 in</b>  <b>Casing Type: Pvc</b>  <b>Screen Length: 10 ft</b>  <b>Top of Screen: 3 ft</b>  <b>Total Depth: 13 ft</b>  <b>Initial Depth to Water: 4.2 ft</b></p>	<p><b>Pump Type: Geotech geopump series 2</b>  <b>Tubing Type: Polyethylene 0.179" x1/4"</b>  <b>Pump Intake From TOC: 8 ft</b>  <b>Estimated Total Volume Pumped: 4950 ml</b>  <b>Flow Cell Volume: 130 ml</b>  <b>Final Flow Rate: 150 ml/min</b>  <b>Final Draw Down: 0.02 ft</b></p>	<p><b>Instrument Used: Aqua TROLL 600 Vented</b>  <b>Serial Number: 469050</b></p>
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## Test Notes:

## Weather Conditions:

Overcast

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15 %		
11/28/2018 10:27 AM	00:00	6.67 pH	56.32 °F	694.32 µS/cm	0.41 mg/L	18,363 NTU	-17.0 mV	4.20 ft	150.00 ml/min
11/28/2018 10:30 AM	03:00	6.67 pH	55.33 °F	1,075.8 µS/cm	0.45 mg/L	4,585.6 NTU	-38.2 mV	4.20 ft	150.00 ml/min
11/28/2018 10:33 AM	06:00	6.67 pH	54.97 °F	1,313.1 µS/cm	0.75 mg/L	8,111.5 NTU	-47.4 mV	4.20 ft	150.00 ml/min
11/28/2018 10:36 AM	09:00	6.71 pH	54.71 °F	1,522.4 µS/cm	1.14 mg/L	2,743.1 NTU	-50.4 mV	4.20 ft	150.00 ml/min
11/28/2018 10:39 AM	12:00	6.74 pH	54.38 °F	1,632.3 µS/cm	1.64 mg/L	3,715.4 NTU	-48.2 mV	4.20 ft	150.00 ml/min
11/28/2018 10:42 AM	15:00	6.77 pH	53.99 °F	1,725.4 µS/cm	2.38 mg/L	0.00 NTU	-44.0 mV	4.20 ft	150.00 ml/min
11/28/2018 10:45 AM	18:00	6.80 pH	53.81 °F	1,852.0 µS/cm	2.65 mg/L	0.00 NTU	-39.9 mV	4.20 ft	150.00 ml/min
11/28/2018 10:48 AM	21:00	6.84 pH	53.74 °F	1,873.4 µS/cm	2.90 mg/L	0.00 NTU	-39.9 mV	4.20 ft	150.00 ml/min
11/28/2018 10:51 AM	24:00	6.85 pH	53.57 °F	1,954.9 µS/cm	3.10 mg/L	0.00 NTU	-33.5 mV	4.20 ft	150.00 ml/min
11/28/2018 10:54 AM	27:00	6.84 pH	53.68 °F	2,154.9 µS/cm	3.03 mg/L	0.00 NTU	-30.4 mV	4.20 ft	150.00 ml/min
11/28/2018 10:57 AM	30:00	6.86 pH	53.61 °F	2,078.5 µS/cm	3.13 mg/L	0.00 NTU	-30.7 mV	4.20 ft	150.00 ml/min
11/28/2018 11:00 AM	33:00	6.88 pH	53.45 °F	2,024.6 µS/cm	3.27 mg/L	0.00 NTU	-29.5 mV	4.20 ft	150.00 ml/min

**Samples**

Sample ID:	Description:
MW-505	Sample tine-1106 Ferrous iron-4.5 ng/l FDTW-4.22

# Low-Flow Test Report:

**Test Date / Time:** 11/29/2018 11:01:20 AM

**Project:** Edmonds Terminal 4Q18

**Operator Name:** EK

<p><b>Location Name: MW-514</b>  <b>Well Diameter: 2 in</b>  <b>Casing Type: PVC</b>  <b>Screen Length: 10 ft</b>  <b>Top of Screen: 3 ft</b>  <b>Total Depth: 13 ft</b>  <b>Initial Depth to Water: 4.25 ft</b></p>	<p><b>Pump Type: Geotech geopump series 2</b>  <b>Tubing Type: Polyethylene 0.170 x 1/4"</b>  <b>Pump Intake From TOC: 8.5 ft</b>  <b>Estimated Total Volume Pumped: 4800 ml</b>  <b>Flow Cell Volume: 130 ml</b>  <b>Final Flow Rate: 200 ml/min</b>  <b>Final Draw Down: 0 ft</b></p>	<p><b>Instrument Used: Aqua TROLL 600 Vented</b>  <b>Serial Number: 467764</b></p>
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## Test Notes:

## Weather Conditions:

50 and cloudy

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15 %		
11/29/2018 11:01 AM	00:00	6.51 pH	56.34 °F	692.52 µS/cm	0.87 mg/L	23.93 NTU	85.6 mV	4.25 ft	200.00 ml/min
11/29/2018 11:04 AM	03:00	6.52 pH	56.42 °F	669.83 µS/cm	0.49 mg/L	5.99 NTU	72.6 mV	4.25 ft	200.00 ml/min
11/29/2018 11:07 AM	06:00	6.53 pH	56.53 °F	662.39 µS/cm	0.32 mg/L	0.00 NTU	66.2 mV	4.25 ft	200.00 ml/min
11/29/2018 11:10 AM	09:00	6.53 pH	56.44 °F	669.79 µS/cm	0.27 mg/L	0.00 NTU	61.4 mV	4.25 ft	200.00 ml/min
11/29/2018 11:13 AM	12:00	6.53 pH	56.40 °F	677.76 µS/cm	0.22 mg/L	0.00 NTU	57.8 mV	4.25 ft	200.00 ml/min
11/29/2018 11:16 AM	15:00	6.54 pH	56.43 °F	688.97 µS/cm	0.20 mg/L	1.01 NTU	54.5 mV	4.25 ft	200.00 ml/min
11/29/2018 11:19 AM	18:00	6.54 pH	56.45 °F	701.30 µS/cm	0.18 mg/L		52.0 mV	4.25 ft	200.00 ml/min
11/29/2018 11:22 AM	21:00	6.54 pH	56.41 °F	724.58 µS/cm	0.18 mg/L		49.5 mV	4.25 ft	200.00 ml/min
11/29/2018 11:25 AM	24:00	6.54 pH	56.43 °F	751.89 µS/cm	0.18 mg/L		47.3 mV	4.25 ft	200.00 ml/min

## Samples

Sample ID:	Description:
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MW-514	Sample time 1130 Final DTW 4.25 ft btoc Ferrous iron 1.0 mg/L
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# Low-Flow Test Report:

**Test Date / Time:** 11/28/2018 11:24:21 AM

**Project:** Edmonds Terminal 4Q18

**Operator Name:** Jason little

<p><b>Location Name:</b> MW-139-R  <b>Well Diameter:</b> 2 cm  <b>Casing Type:</b> Pvc  <b>Screen Length:</b> 10.4 ft  <b>Top of Screen:</b> 4.5 ft  <b>Total Depth:</b> 14.9 ft  <b>Initial Depth to Water:</b> 6.53 ft</p>	<p><b>Pump Type:</b> Geotech geopump series 2  <b>Tubing Type:</b> Polyethylene 0.179" x1/4"  <b>Pump Intake From TOC:</b> 9.5 ft  <b>Estimated Total Volume Pumped:</b> 2700 ml  <b>Flow Cell Volume:</b> 130 ml  <b>Final Flow Rate:</b> 150 ml/min  <b>Final Draw Down:</b> 0.02 ft</p>	<p><b>Instrument Used:</b> Aqua TROLL 600 Vented  <b>Serial Number:</b> 469050</p>
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## Test Notes:

## Weather Conditions:

Rain

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15 %		
11/28/2018 11:24 AM	00:00	7.35 pH	54.48 °F	2,024.7 µS/cm	6.44 mg/L	8,684.2 NTU	19.0 mV	6.53 ft	150.00 ml/min
11/28/2018 11:27 AM	03:00	7.38 pH	54.32 °F	2,025.2 µS/cm	6.38 mg/L	5,618.4 NTU	53.0 mV	6.53 ft	150.00 ml/min
11/28/2018 11:30 AM	06:00	7.38 pH	54.37 °F	1,995.1 µS/cm	6.33 mg/L	4,873.5 NTU	65.1 mV	6.53 ft	150.00 ml/min
11/28/2018 11:33 AM	09:00	7.46 pH	53.91 °F	1,482.9 µS/cm	6.60 mg/L	7,585.2 NTU	74.1 mV	6.53 ft	150.00 ml/min
11/28/2018 11:36 AM	12:00	7.46 pH	53.59 °F	1,396.6 µS/cm	6.70 mg/L	6,087.5 NTU	86.1 mV	6.53 ft	150.00 ml/min
11/28/2018 11:39 AM	15:00	7.46 pH	53.64 °F	1,384.9 µS/cm	6.67 mg/L	4,445.1 NTU	92.3 mV	6.53 ft	150.00 ml/min
11/28/2018 11:42 AM	18:00	7.45 pH	53.25 °F	1,370.7 µS/cm	6.69 mg/L	4,576.6 NTU	99.0 mV	6.53 ft	150.00 ml/min

## Samples

Sample ID:	Description:
MW-139-R	Sample time-1150 FDTW-6.55 Ferrous iron-0.0





# Low-Flow Test Report:

**Test Date / Time:** 11/28/2018 12:29:47 PM

**Project:** Edmonds Terminal 4Q18

**Operator Name:** KF

<p><b>Location Name: MW-101</b>  <b>Well Diameter: 2 in</b>  <b>Casing Type: PVC</b>  <b>Screen Length: 10 ft</b>  <b>Top of Screen: 3 ft</b>  <b>Total Depth: 13 ft</b>  <b>Initial Depth to Water: 8.03 ft</b></p>	<p><b>Pump Type: Geotech geopump Series 2</b>  <b>Tubing Type: Polyethylene 0.170" x 1/4"</b>  <b>Pump Intake From TOC: 10 ft</b>  <b>Estimated Total Volume Pumped: 5350 ml</b>  <b>Flow Cell Volume: 130 ml</b>  <b>Final Flow Rate: 150 ml/min</b>  <b>Final Draw Down: 0.24 ft</b></p>	<p><b>Instrument Used: Aqua TROLL 600 Vented</b>  <b>Serial Number: 565206</b></p>
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## Test Notes:

## Weather Conditions:

Overcast

52°F

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15 %		
11/28/2018 12:29 PM	00:00	6.91 pH	56.68 °F	1,477.5 µS/cm	4.22 mg/L	2.84 NTU	-59.5 mV	8.03 ft	150.00 ml/min
11/28/2018 12:32 PM	03:00	7.07 pH	57.05 °F	1,508.4 µS/cm	0.92 mg/L	1.80 NTU	-84.4 mV	8.03 ft	150.00 ml/min
11/28/2018 12:35 PM	06:00	7.04 pH	57.14 °F	1,492.4 µS/cm	1.12 mg/L	0.00 NTU	-75.8 mV	8.03 ft	150.00 ml/min
11/28/2018 12:38 PM	09:00	7.05 pH	57.01 °F	1,491.5 µS/cm	0.92 mg/L	0.00 NTU	-81.1 mV	8.03 ft	150.00 ml/min
11/28/2018 12:41 PM	12:00	7.05 pH	56.90 °F	1,491.3 µS/cm	0.99 mg/L	0.00 NTU	-81.2 mV	8.03 ft	150.00 ml/min
11/28/2018 12:44 PM	15:00	7.05 pH	56.79 °F	1,490.4 µS/cm	1.00 mg/L	0.00 NTU	-80.7 mV	8.03 ft	150.00 ml/min
11/28/2018 12:47 PM	17:40	7.07 pH	56.26 °F	1,503.3 µS/cm	1.05 mg/L	0.47 NTU	-83.8 mV	8.03 ft	150.00 ml/min
11/28/2018 12:50 PM	20:40	7.05 pH	57.19 °F	1,468.4 µS/cm	0.87 mg/L	0.00 NTU	-83.7 mV	8.03 ft	150.00 ml/min
11/28/2018 12:53 PM	23:40	7.00 pH	57.17 °F	1,476.2 µS/cm	0.92 mg/L	0.00 NTU	-67.3 mV	8.03 ft	150.00 ml/min
11/28/2018 12:56 PM	26:40	7.00 pH	57.20 °F	1,474.9 µS/cm	0.89 mg/L	0.00 NTU	-67.5 mV	8.03 ft	150.00 ml/min
11/28/2018 12:59 PM	29:40	7.00 pH	57.25 °F	1,491.8 µS/cm	0.73 mg/L	0.00 NTU	-67.1 mV	8.03 ft	150.00 ml/min
11/28/2018 1:02 PM	32:40	7.00 pH	57.29 °F	1,484.2 µS/cm	0.64 mg/L	0.93 NTU	-69.1 mV	8.03 ft	150.00 ml/min

11/28/2018 2:05 PM	35:40	7.00 pH	57.30 °F	1,463.0 µS/cm	0.69 mg/L	0.00 NTU	-63.7 mV	8.03 ft	150.00 ml/min
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## Samples

Sample ID:	Description:
MW-101	Final DTW: 8.27 Iron: 6.0 mg/L Sample Time: 1245

# Low-Flow Test Report:

Test Date / Time: 11/29/2018 12:00:26 PM

Project: Edmonds Terminal 4Q18

Operator Name: EK

<b>Location Name: MW-520</b> <b>Well Diameter: 2 in</b> <b>Casing Type: PVC</b> <b>Screen Length: 10 ft</b> <b>Top of Screen: 3 ft</b> <b>Total Depth: 13 ft</b> <b>Initial Depth to Water: 6.5 ft</b>	<b>Pump Type: Geotech geopump series 2</b> <b>Tubing Type: Polyethylene 0.170 x 1/4"</b> <b>Pump Intake From TOC: 9.5 ft</b> <b>Estimated Total Volume Pumped: 1200 ml</b> <b>Flow Cell Volume: 130 ml</b> <b>Final Flow Rate: 200 ml/min</b> <b>Final Draw Down: 0.01 ft</b>	<b>Instrument Used: Aqua TROLL 600 Vented</b> <b>Serial Number: 467764</b>
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## Test Notes:

## Weather Conditions:

50 and cloudy

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15 %		
11/29/2018 12:00 PM	00:00	6.88 pH	55.19 °F	1,233.5 µS/cm	6.82 mg/L		92.5 mV	6.50 ft	200.00 ml/min
11/29/2018 12:03 PM	03:00	6.96 pH	55.14 °F	1,229.4 µS/cm	6.55 mg/L		91.2 mV	6.50 ft	200.00 ml/min
11/29/2018 12:06 PM	06:00	6.97 pH	55.00 °F	1,224.6 µS/cm	6.42 mg/L		91.7 mV	6.50 ft	200.00 ml/min

## Samples

Sample ID:	Description:
MW-520	Sample time 1210 Final DTW -6.51 Ferrous irin-0.0

# Low-Flow Test Report:

Test Date / Time: 11/28/2018 12:27:33 PM

Project: Edmonds Terminal 4Q18

Operator Name: Jason little

<b>Location Name: MW-515</b> <b>Well Diameter: 2 in</b> <b>Casing Type: Pvc</b> <b>Screen Length: 10 ft</b> <b>Top of Screen: 3 ft</b> <b>Total Depth: 13 ft</b> <b>Initial Depth to Water: 4.35 ft</b>	<b>Pump Type: Geotech geopump series 2</b> <b>Tubing Type: Polyethylene 0.179" x1/4"</b> <b>Pump Intake From TOC: 7.5 ft</b> <b>Estimated Total Volume Pumped: 900 ml</b> <b>Flow Cell Volume: 130 ml</b> <b>Final Flow Rate: 150 ml/min</b> <b>Final Draw Down: 0 ft</b>	<b>Instrument Used: Aqua TROLL 600 Vented</b> <b>Serial Number: 469050</b>
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## Test Notes:

## Weather Conditions:

Over cast

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15 %		
11/28/2018 12:27 PM	00:00	7.02 pH	56.13 °F	723.23 µS/cm	2.26 mg/L	2,977.2 NTU	78.3 mV	4.35 ft	150.00 ml/min
11/28/2018 12:30 PM	03:00	6.97 pH	55.76 °F	753.09 µS/cm	2.19 mg/L	0.00 NTU	91.8 mV	4.35 ft	150.00 ml/min
11/28/2018 12:33 PM	06:00	6.96 pH	55.71 °F	789.58 µS/cm	2.39 mg/L	0.00 NTU	92.1 mV	4.35 ft	150.00 ml/min

## Samples

Sample ID:	Description:
MW-515	Sample time -1240 FDTW-4.35 Ferrous iron-0.0

# Low-Flow Test Report:

Test Date / Time: 11/29/2018 7:27:49 AM

Project: Edmonds Terminal 4Q18

Operator Name: KF

<b>Location Name: MW-511</b> <b>Well Diameter: 2 in</b> <b>Casing Type: PVC</b> <b>Screen Length: 10 ft</b> <b>Top of Screen: 3 ft</b> <b>Total Depth: 13 ft</b> <b>Initial Depth to Water: 7.92 ft</b>	<b>Pump Type: Geotech geopump Series 2</b> <b>Tubing Type: Polyethylene 0.170" x 1/4"</b> <b>Pump Intake From TOC: 10 ft</b> <b>Estimated Total Volume Pumped: 40815 ml</b> <b>Flow Cell Volume: 130 ml</b> <b>Final Flow Rate: 150 ml/min</b> <b>Final Draw Down: 0 ft</b>	<b>Instrument Used: Aqua TROLL 600 Vented</b> <b>Serial Number: 565206</b>
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## Test Notes:

## Weather Conditions:

Overcast

47°F

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15 %		
11/29/2018 7:27 AM	00:00	6.37 pH	54.27 °F	173.17 µS/cm	4.43 mg/L		177.8 mV	7.92 ft	150.00 ml/min
11/29/2018 1:59 PM	04:32:06	8.17 pH	58.70 °F	1.72 µS/cm	10.43 mg/L	0.00 NTU	90.3 mV	7.92 ft	150.00 ml/min

## Samples

Sample ID:	Description:
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# Low-Flow Test Report:

**Test Date / Time:** 11/29/2018 9:22:03 AM

**Project:** Edmonds Terminal 4Q18

**Operator Name:** KF

<p><b>Location Name: MW-512</b>  <b>Well Diameter: 2 in</b>  <b>Casing Type: PVC</b>  <b>Screen Length: 10 ft</b>  <b>Top of Screen: 3 ft</b>  <b>Total Depth: 13 ft</b>  <b>Initial Depth to Water: 6.05 ft</b></p>	<p><b>Pump Type: Geotech geopump Series 2</b>  <b>Tubing Type: Polyethylene 0.170" x 1/4"</b>  <b>Pump Intake From TOC: 10 ft</b>  <b>Estimated Total Volume Pumped: 7450 ml</b>  <b>Flow Cell Volume: 130 ml</b>  <b>Final Flow Rate: 150 ml/min</b>  <b>Final Draw Down: 0.02 ft</b></p>	<p><b>Instrument Used: Aqua TROLL 600 Vented</b>  <b>Serial Number: 565206</b></p>
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## Test Notes:

## Weather Conditions:

Overcast

47°F

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15 %		
11/29/2018 9:22 AM	00:00	6.80 pH	55.83 °F	627.53 µS/cm	1.73 mg/L		102.1 mV	6.05 ft	150.00 ml/min
11/29/2018 9:25 AM	03:00	6.85 pH	56.35 °F	675.00 µS/cm	0.21 mg/L		37.4 mV	6.05 ft	150.00 ml/min
11/29/2018 9:28 AM	06:00	6.86 pH	56.36 °F	684.67 µS/cm	0.15 mg/L		4.8 mV	6.05 ft	150.00 ml/min
11/29/2018 9:31 AM	09:00	6.85 pH	56.19 °F	698.73 µS/cm	0.21 mg/L	0.00 NTU	-15.4 mV	6.05 ft	150.00 ml/min
11/29/2018 9:34 AM	12:00	6.83 pH	56.22 °F	679.93 µS/cm	0.26 mg/L	0.00 NTU	-25.3 mV	6.05 ft	150.00 ml/min
11/29/2018 9:37 AM	15:00	6.81 pH	56.09 °F	652.57 µS/cm	0.60 mg/L	0.00 NTU	-28.5 mV	6.05 ft	150.00 ml/min
11/29/2018 9:40 AM	18:00	6.80 pH	56.09 °F	625.65 µS/cm	0.78 mg/L	0.00 NTU	-31.8 mV	6.05 ft	150.00 ml/min
11/29/2018 9:43 AM	21:00	6.79 pH	56.09 °F	620.13 µS/cm	0.94 mg/L	0.00 NTU	-31.6 mV	6.05 ft	150.00 ml/min
11/29/2018 9:46 AM	24:00	6.77 pH	56.03 °F	610.54 µS/cm	1.08 mg/L	0.00 NTU	-28.3 mV	6.05 ft	150.00 ml/min
11/29/2018 9:56 AM	34:40	6.78 pH	55.91 °F	617.77 µS/cm	2.65 mg/L	0.00 NTU	-13.4 mV	6.05 ft	150.00 ml/min
11/29/2018 9:59 AM	37:40	6.77 pH	56.11 °F	618.03 µS/cm	1.29 mg/L	0.00 NTU	-20.4 mV	6.05 ft	150.00 ml/min
11/29/2018 10:02 AM	40:40	6.77 pH	56.15 °F	617.77 µS/cm	1.33 mg/L	0.00 NTU	-18.5 mV	6.05 ft	150.00 ml/min

11/29/2018 10:05 AM	43:40	6.76 pH	56.21 °F	602.85 µS/cm	1.31 mg/L	0.00 NTU	-23.2 mV	6.05 ft	150.00 ml/min
11/29/2018 10:08 AM	46:40	6.76 pH	56.15 °F	610.76 µS/cm	1.37 mg/L	0.00 NTU	-27.2 mV	6.05 ft	150.00 ml/min
11/29/2018 10:11 AM	49:40	6.78 pH	56.20 °F	602.89 µS/cm	1.46 mg/L	0.00 NTU	-25.2 mV	6.05 ft	150.00 ml/min

## Samples

Sample ID:	Description:
MW-512	Final DTW: 6.07 Iron: 1.0 mg/L Sample Time: 1015



# Low-Flow Test Report:

**Test Date / Time:** 11/29/2018 9:38:13 AM

**Project:** Edmonds Terminal 4Q18

**Operator Name:** Jason little

<b>Location Name:</b> MW-516 <b>Well Diameter:</b> 2 cm <b>Casing Type:</b> Pvc <b>Screen Length:</b> 10 ft <b>Top of Screen:</b> 3 ft <b>Total Depth:</b> 13 ft <b>Initial Depth to Water:</b> 4.09 ft	<b>Pump Type:</b> Geotech geopump series 2 <b>Tubing Type:</b> Polyethylene 0.179" x1/4" <b>Pump Intake From TOC:</b> 9.5 ft <b>Estimated Total Volume Pumped:</b> 900 ml <b>Flow Cell Volume:</b> 130 ml <b>Final Flow Rate:</b> 150 ml/min <b>Final Draw Down:</b> 0 ft	<b>Instrument Used:</b> Aqua TROLL 600 Vented <b>Serial Number:</b> 469050
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## Test Notes:

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15 %		
11/29/2018 9:38 AM	00:00	6.86 pH	56.14 °F	427.27 µS/cm	2.87 mg/L	0.00 NTU	122.6 mV	4.09 ft	150.00 ml/min
11/29/2018 9:41 AM	03:00	6.88 pH	55.76 °F	395.50 µS/cm	3.26 mg/L	0.00 NTU	137.2 mV	4.09 ft	150.00 ml/min
11/29/2018 9:44 AM	06:00	6.90 pH	55.69 °F	417.93 µS/cm	3.31 mg/L	0.00 NTU	140.1 mV	4.09 ft	150.00 ml/min

## Samples

Sample ID:	Description:
MW-516	Sample time-0950 Ferrous iron-0.0 FDTW-4.09

# Low-Flow Test Report:

**Test Date / Time:** 11/29/2018 10:48:05 AM

**Project:** Edmonds Terminal 4Q18

**Operator Name:** KF

<p><b>Location Name: MW-20R</b>  <b>Well Diameter: 2 in</b>  <b>Casing Type: PVC</b>  <b>Screen Length: 10 ft</b>  <b>Top of Screen: 3 ft</b>  <b>Total Depth: 13 ft</b>  <b>Initial Depth to Water: 5.33 ft</b></p>	<p><b>Pump Type: Geotech geopump Series 2</b>  <b>Tubing Type: Polyethylene 0.170" x 1/4"</b>  <b>Pump Intake From TOC: 10 ft</b>  <b>Estimated Total Volume Pumped: 5567.5 ml</b>  <b>Flow Cell Volume: 130 ml</b>  <b>Final Flow Rate: 150 ml/min</b>  <b>Final Draw Down: 0 ft</b></p>	<p><b>Instrument Used: Aqua TROLL 600 Vented</b>  <b>Serial Number: 565206</b></p>
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## Test Notes:

## Weather Conditions:

Overcast

48°F

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15 %		
11/29/2018 10:48 AM	00:00	6.16 pH	56.25 °F	2,097.3 µS/cm	9.34 mg/L		95.6 mV	5.33 ft	150.00 ml/min
11/29/2018 10:51 AM	03:00	5.91 pH	55.58 °F	2,091.5 µS/cm	9.16 mg/L		136.5 mV	5.33 ft	150.00 ml/min
11/29/2018 10:54 AM	06:00	5.90 pH	55.41 °F	2,093.5 µS/cm	9.10 mg/L	2.84 NTU	149.3 mV	5.33 ft	150.00 ml/min
11/29/2018 10:57 AM	09:00	6.23 pH	55.66 °F	6,651.6 µS/cm	3.64 mg/L	7.99 NTU	138.5 mV	5.33 ft	150.00 ml/min
11/29/2018 10:58 AM	10:07	6.39 pH	55.68 °F	7,877.8 µS/cm	2.89 mg/L	2.00 NTU	117.8 mV	5.33 ft	150.00 ml/min
11/29/2018 11:01 AM	13:07	6.59 pH	55.70 °F	9,750.0 µS/cm	2.01 mg/L	0.87 NTU	70.7 mV	5.33 ft	150.00 ml/min
11/29/2018 11:04 AM	16:07	6.66 pH	55.72 °F	10,705 µS/cm	1.75 mg/L	0.00 NTU	25.3 mV	5.33 ft	150.00 ml/min
11/29/2018 11:07 AM	19:07	6.71 pH	55.70 °F	11,099 µS/cm	1.89 mg/L	0.00 NTU	-19.5 mV	5.33 ft	150.00 ml/min
11/29/2018 11:10 AM	22:07	6.75 pH	55.72 °F	11,504 µS/cm	1.66 mg/L	0.00 NTU	-43.6 mV	5.33 ft	150.00 ml/min
11/29/2018 11:13 AM	25:07	6.77 pH	55.72 °F	11,773 µS/cm	1.58 mg/L	0.00 NTU	-60.4 mV	5.33 ft	150.00 ml/min
11/29/2018 11:16 AM	28:07	6.79 pH	55.71 °F	12,089 µS/cm	1.51 mg/L	0.00 NTU	-68.1 mV	5.33 ft	150.00 ml/min
11/29/2018 11:19 AM	31:07	6.81 pH	55.70 °F	12,256 µS/cm	1.42 mg/L	0.00 NTU	-76.8 mV	5.33 ft	150.00 ml/min

11/29/2018 11:22 AM	34:07	6.82 pH	55.68 °F	12,343 µS/cm	1.43 mg/L	0.00 NTU	-79.9 mV	5.33 ft	150.00 ml/min
11/29/2018 11:25 AM	37:07	6.84 pH	55.71 °F	12,493 µS/cm	1.48 mg/L	0.00 NTU	-85.7 mV	5.33 ft	150.00 ml/min

## Samples

Sample ID:	Description:
MW-20R	Final DTW: 5.33 Iron: 1.5 mg/L Sample Time: 1135 DUP-3 Taken

# Low-Flow Test Report:

**Test Date / Time:** 11/29/2018 10:13:13 PM

**Project:** Edmonds Terminal 4Q18

**Operator Name:** Jason little

<p><b>Location Name: MW-513</b>  <b>Well Diameter: 2 in</b>  <b>Casing Type: Pvc</b>  <b>Screen Length: 10 ft</b>  <b>Top of Screen: 3 ft</b>  <b>Total Depth: 13 ft</b>  <b>Initial Depth to Water: 3.92 ft</b></p>	<p><b>Pump Type: Geotech geopump series 2</b>  <b>Tubing Type: Polyethylene 0.179" x1/4"</b>  <b>Pump Intake From TOC: 9.5 ft</b>  <b>Estimated Total Volume Pumped: 5400 ml</b>  <b>Flow Cell Volume: 130 ml</b>  <b>Final Flow Rate: 150 ml/min</b>  <b>Final Draw Down: 0.01 ft</b></p>	<p><b>Instrument Used: Aqua TROLL 600 Vented</b>  <b>Serial Number: 469050</b></p>
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## Test Notes:

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15 %		
11/29/2018 10:13 AM	00:00	6.71 pH	56.20 °F	3,105.0 µS/cm	0.22 mg/L	24,242 NTU	-9.9 mV	3.92 ft	150.00 ml/min
11/29/2018 10:16 AM	03:00	6.74 pH	55.99 °F	3,075.2 µS/cm	0.18 mg/L	23,489 NTU	-29.2 mV	3.92 ft	150.00 ml/min
11/29/2018 10:19 AM	06:00	6.75 pH	55.96 °F	3,096.7 µS/cm	0.09 mg/L	7,509.1 NTU	-40.6 mV	3.92 ft	150.00 ml/min
11/29/2018 10:22 AM	09:00	6.76 pH	55.82 °F	3,026.3 µS/cm	0.10 mg/L	5,222.3 NTU	-47.8 mV	3.92 ft	150.00 ml/min
11/29/2018 10:25 AM	12:00	6.77 pH	55.75 °F	2,912.7 µS/cm	0.12 mg/L	0.00 NTU	-52.3 mV	3.92 ft	150.00 ml/min
11/29/2018 10:28 AM	15:00	6.78 pH	55.66 °F	2,755.8 µS/cm	0.16 mg/L	0.00 NTU	-55.0 mV	3.92 ft	150.00 ml/min
11/29/2018 10:31 AM	18:00	6.78 pH	55.64 °F	2,616.0 µS/cm	0.20 mg/L	0.00 NTU	-59.6 mV	3.92 ft	150.00 ml/min
11/29/2018 10:34 AM	21:00	6.79 pH	55.59 °F	2,483.2 µS/cm	0.27 mg/L	0.00 NTU	-61.9 mV	3.92 ft	150.00 ml/min
11/29/2018 10:37 AM	24:00	6.80 pH	55.71 °F	2,464.7 µS/cm	0.31 mg/L	0.00 NTU	-67.1 mV	3.92 ft	150.00 ml/min
11/29/2018 10:40 AM	27:00	6.83 pH	55.66 °F	2,242.2 µS/cm	0.37 mg/L	0.00 NTU	-70.1 mV	3.92 ft	150.00 ml/min
11/29/2018 10:43 AM	30:00	6.81 pH	55.68 °F	2,329.9 µS/cm	0.42 mg/L	0.00 NTU	-70.6 mV	3.92 ft	150.00 ml/min
11/29/2018 10:46 AM	33:00	6.80 pH	55.67 °F	2,521.7 µS/cm	0.41 mg/L	0.00 NTU	-72.8 mV	3.92 ft	150.00 ml/min
11/29/2018 10:49 AM	36:00	6.81 pH	55.74 °F	2,540.8 µS/cm	0.41 mg/L	0.00 NTU	-75.2 mV	3.92 ft	150.00 ml/min

**Samples**

Sample ID:	Description:
MW-513	Sample time-1055 Fdtw-3.93 Ferrous iron-5.5 m/l

# Low-Flow Test Report:

Test Date / Time: 11/29/2018 12:08:54 PM

Project: Edmonds Terminal 4Q18

Operator Name: KF

<b>Location Name: MW-519</b> <b>Well Diameter: 2 in</b> <b>Casing Type: PVC</b> <b>Screen Length: 10 ft</b> <b>Top of Screen: 3 ft</b> <b>Total Depth: 13 ft</b> <b>Initial Depth to Water: 5.8 ft</b>	<b>Pump Type: Geotech geopump Series 2</b> <b>Tubing Type: Polyethylene 0.170" x 1/4"</b> <b>Pump Intake From TOC: 8 ft</b> <b>Estimated Total Volume Pumped: 1800 ml</b> <b>Flow Cell Volume: 130 ml</b> <b>Final Flow Rate: 150 ml/min</b> <b>Final Draw Down: 0 ft</b>	<b>Instrument Used: Aqua TROLL 600 Vented</b> <b>Serial Number: 565206</b>
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## Test Notes:

## Weather Conditions:

Overcast

48°F

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15 %		
11/29/2018 12:08 PM	00:00	7.78 pH	55.20 °F	504.74 µS/cm	9.38 mg/L	3.72 NTU	30.8 mV	5.80 ft	150.00 ml/min
11/29/2018 12:11 PM	03:00	7.71 pH	54.59 °F	493.40 µS/cm	9.23 mg/L	0.00 NTU	68.6 mV	5.80 ft	150.00 ml/min
11/29/2018 12:14 PM	06:00	7.64 pH	54.46 °F	487.88 µS/cm	8.81 mg/L	0.00 NTU	84.1 mV	5.80 ft	150.00 ml/min
11/29/2018 12:17 PM	09:00	7.56 pH	54.32 °F	482.50 µS/cm	8.40 mg/L	0.00 NTU	90.5 mV	5.80 ft	150.00 ml/min
11/29/2018 12:20 PM	12:00	7.51 pH	54.33 °F	483.32 µS/cm	8.01 mg/L	0.00 NTU	97.4 mV	5.80 ft	150.00 ml/min

## Samples

Sample ID:	Description:
MW-519	Final DTW: 5.80 Iron: 0.0 mg/L Sample Time: 1230  Metals Batch QC



# Low-Flow Test Report:

**Test Date / Time:** 11/29/2018 11:17:08 AM

**Project:** Edmonds Terminal 4Q18

**Operator Name:** Jason little

<b>Location Name:</b> MW-522 <b>Well Diameter:</b> 2 in <b>Casing Type:</b> Pvc <b>Screen Length:</b> 10 ft <b>Top of Screen:</b> 3 ft <b>Total Depth:</b> 13 ft <b>Initial Depth to Water:</b> 7.05 ft	<b>Pump Type:</b> Geotech geopump series 2 <b>Tubing Type:</b> Polyethylene 0.179" x1/4" <b>Pump Intake From TOC:</b> 10 ft <b>Estimated Total Volume Pumped:</b> 2250 ml <b>Flow Cell Volume:</b> 130 ml <b>Final Flow Rate:</b> 150 ml/min <b>Final Draw Down:</b> 0.06 ft	<b>Instrument Used:</b> Aqua TROLL 600 Vented <b>Serial Number:</b> 469050
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## Test Notes:

## Weather Conditions:

Overcast

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15 %		
11/29/2018 11:17 AM	00:00	7.37 pH	53.29 °F	837.87 µS/cm	8.48 mg/L	0.00 NTU	33.7 mV	7.05 ft	150.00 ml/min
11/29/2018 11:20 AM	03:00	7.33 pH	53.16 °F	837.72 µS/cm	8.45 mg/L	0.00 NTU	117.4 mV	7.05 ft	150.00 ml/min
11/29/2018 11:23 AM	06:00	7.32 pH	53.12 °F	841.01 µS/cm	8.47 mg/L	0.00 NTU	134.8 mV	7.05 ft	150.00 ml/min
11/29/2018 1:26 AM	09:00	7.32 pH	53.17 °F	842.79 µS/cm	8.46 mg/L	0.00 NTU	148.4 mV	7.05 ft	150.00 ml/min
11/29/2018 11:29 AM	12:00	7.32 pH	53.17 °F	844.23 µS/cm	8.44 mg/L	0.00 NTU	160.4 mV	7.05 ft	150.00 ml/min
11/29/2018 11:32 AM	15:00	7.32 pH	53.17 °F	845.16 µS/cm	8.44 mg/L	0.00 NTU	164.7 mV	7.05 ft	150.00 ml/min

## Samples

Sample ID:	Description:
MW-522	Sample time-1140 Ferrous iro-0.0 FDTW-7.11





# Low-Flow Test Report:

**Test Date / Time:** 11/29/2018 12:00:40 PM

**Project:** Edmonds Terminal 4Q18

**Operator Name:** Jason little

<p><b>Location Name: MW-8R</b>  <b>Well Diameter: 2 in</b>  <b>Casing Type: Pvc</b>  <b>Screen Length: 10 ft</b>  <b>Top of Screen: 3 ft</b>  <b>Total Depth: 13 ft</b>  <b>Initial Depth to Water: 7.04 ft</b></p>	<p><b>Pump Type: Geotech geopump series 2</b>  <b>Tubing Type: Polyethylene 0.179" x1/4"</b>  <b>Pump Intake From TOC: 10 ft</b>  <b>Estimated Total Volume Pumped: 2250 ml</b>  <b>Flow Cell Volume: 130 ml</b>  <b>Final Flow Rate: 150 ml/min</b>  <b>Final Draw Down: 0 ft</b></p>	<p><b>Instrument Used: Aqua TROLL 600 Vented</b>  <b>Serial Number: 469050</b></p>
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**Test Notes:**

**Weather Conditions:**

Overcast

**Low-Flow Readings:**

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15 %		
11/29/2018 12:00 PM	00:00	7.28 pH	55.33 °F	362.40 µS/cm	2.21 mg/L	0.00 NTU	116.7 mV	7.04 ft	150.00 ml/min
11/29/2018 12:03 PM	03:00	7.09 pH	56.16 °F	361.43 µS/cm	0.88 mg/L	3,245.1 NTU	121.3 mV	7.04 ft	150.00 ml/min
11/29/2018 12:06 PM	06:00	7.08 pH	56.33 °F	375.08 µS/cm	1.26 mg/L	1,294.9 NTU	121.7 mV	7.04 ft	150.00 ml/min
11/29/2018 12:09 PM	09:00	7.07 pH	56.39 °F	386.60 µS/cm	1.48 mg/L	0.00 NTU	122.2 mV	7.04 ft	150.00 ml/min
11/29/2018 12:12 PM	12:00	7.07 pH	56.42 °F	391.33 µS/cm	1.70 mg/L	0.00 NTU	125.0 mV	7.04 ft	150.00 ml/min
11/29/2018 12:15 PM	15:00	7.08 pH	56.56 °F	391.20 µS/cm	1.52 mg/L	0.00 NTU	124.0 mV	7.04 ft	150.00 ml/min

**Samples**

Sample ID:	Description:
MW-8R	Sample time 1220 Fdtw-7.04 Ferrous iron-0.0



# Low-Flow Test Report:

Test Date / Time: 11/30/2018 8:37:33 AM

Project: Edmonds Terminal 4Q18

Operator Name: KF

<b>Location Name: MW-126</b> <b>Well Diameter: 2 in</b> <b>Casing Type: PVC</b> <b>Screen Length: 10 ft</b> <b>Top of Screen: 3 ft</b> <b>Total Depth: 13 ft</b> <b>Initial Depth to Water: 4.49 ft</b>	<b>Pump Type: Geotech geopump Series 2</b> <b>Tubing Type: Polyethylene 0.170" x 1/4"</b> <b>Pump Intake From TOC: 8 ft</b> <b>Estimated Total Volume Pumped: 1350 ml</b> <b>Flow Cell Volume: 130 ml</b> <b>Final Flow Rate: 150 ml/min</b> <b>Final Draw Down: 0 ft</b>	<b>Instrument Used: Aqua TROLL 600 Vented</b> <b>Serial Number: 565206</b>
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## Test Notes:

## Weather Conditions:

Overcast

46°F

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15 %		
11/30/2018 8:37 AM	00:00	7.20 pH	52.08 °F	549.67 µS/cm	10.88 mg/L	11.35 NTU	112.1 mV	4.49 ft	150.00 ml/min
11/30/2018 8:40 AM	03:00	7.12 pH	52.24 °F	524.27 µS/cm	10.47 mg/L	8.63 NTU	127.9 mV	4.49 ft	150.00 ml/min
11/30/2018 8:43 AM	06:00	7.10 pH	52.27 °F	518.77 µS/cm	10.42 mg/L	1.31 NTU	135.2 mV	4.49 ft	150.00 ml/min
11/30/2018 8:46 AM	09:00	7.09 pH	52.38 °F	514.46 µS/cm	10.25 mg/L	0.00 NTU	136.1 mV	4.49 ft	150.00 ml/min

## Samples

Sample ID:	Description:
MW-126	Final DTW: 5.73 Iron: 0.0 mg/L Sample Time: 0900

# Low-Flow Test Report:

Test Date / Time: 11/30/2018 9:32:57 AM

Project: Edmonds Terminal 4Q18

Operator Name: KF

<b>Location Name: MW-143</b> <b>Well Diameter: 2 in</b> <b>Casing Type: PVC</b> <b>Screen Length: 10 ft</b> <b>Top of Screen: 3 ft</b> <b>Total Depth: 13 ft</b> <b>Initial Depth to Water: 4.91 ft</b>	<b>Pump Type: Geotech geopump Series 2</b> <b>Tubing Type: Polyethylene 0.170" x 1/4"</b> <b>Pump Intake From TOC: 8 ft</b> <b>Estimated Total Volume Pumped: 6750 ml</b> <b>Flow Cell Volume: 130 ml</b> <b>Final Flow Rate: 150 ml/min</b>	<b>Instrument Used: Aqua TROLL 600 Vented</b> <b>Serial Number: 565206</b>
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## Test Notes:

## Weather Conditions:

Overcast

44°F

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15 %		
11/30/2018 9:32 AM	00:00	6.08 pH	54.13 °F	98.72 µS/cm	0.32 mg/L	2.17 NTU	-94.6 mV	4.91 ft	150.00 ml/min
11/30/2018 9:35 AM	03:00	6.09 pH	54.35 °F	101.18 µS/cm	0.21 mg/L	0.85 NTU	-118.1 mV	4.91 ft	150.00 ml/min
11/30/2018 9:38 AM	06:00	6.09 pH	54.40 °F	101.05 µS/cm	0.33 mg/L	0.38 NTU	-134.0 mV	4.91 ft	150.00 ml/min
11/30/2018 9:41 AM	09:00	6.11 pH	54.44 °F	102.95 µS/cm	0.53 mg/L	0.80 NTU	-145.2 mV	4.91 ft	150.00 ml/min
11/30/2018 9:44 AM	12:00	6.11 pH	54.73 °F	104.07 µS/cm	0.35 mg/L	0.34 NTU	-146.1 mV	4.91 ft	150.00 ml/min
11/30/2018 9:47 AM	15:00	6.12 pH	54.92 °F	107.21 µS/cm	0.78 mg/L	0.68 NTU	-146.2 mV	4.91 ft	150.00 ml/min
11/30/2018 9:50 AM	18:00	6.11 pH	55.07 °F	107.24 µS/cm	0.32 mg/L	0.90 NTU	-151.8 mV	4.91 ft	150.00 ml/min
11/30/2018 9:53 AM	21:00	6.14 pH	55.05 °F	114.75 µS/cm	0.45 mg/L	1.07 NTU	-160.6 mV	4.91 ft	150.00 ml/min
11/30/2018 9:56 AM	24:00	6.15 pH	55.15 °F	113.66 µS/cm	0.32 mg/L	1.72 NTU	-160.7 mV	4.91 ft	150.00 ml/min
11/30/2018 9:59 AM	27:00	6.14 pH	55.09 °F	116.16 µS/cm	0.44 mg/L	0.99 NTU	-164.3 mV	4.91 ft	150.00 ml/min
11/30/2018 10:02 AM	30:00	6.17 pH	55.19 °F	122.18 µS/cm	0.56 mg/L	1.18 NTU	-160.7 mV	4.91 ft	150.00 ml/min
11/30/2018 10:05 AM	33:00	6.37 pH	55.52 °F	289.95 µS/cm	0.49 mg/L	0.00 NTU	-157.3 mV	4.91 ft	150.00 ml/min

11/30/2018 10:08 AM	36:00	6.39 pH	55.65 °F	284.79 µS/cm	0.07 mg/L	0.00 NTU	-171.2 mV	4.91 ft	150.00 ml/min
11/30/2018 10:11 AM	39:00	6.39 pH	55.65 °F	279.26 µS/cm	0.12 mg/L	0.00 NTU	-179.6 mV	4.91 ft	150.00 ml/min
11/30/2018 10:14 AM	42:00	6.41 pH	55.68 °F	323.35 µS/cm	0.06 mg/L	0.00 NTU	-173.1 mV	4.91 ft	150.00 ml/min
11/30/2018 10:17 AM	45:00	6.41 pH	55.58 °F	318.03 µS/cm	0.06 mg/L	0.00 NTU	-180.2 mV	4.91 ft	150.00 ml/min

## Samples

Sample ID:	Description:
MW-143	Final DTW: 7.61 Iron: 7.0 mg/L Sample Time: 1010

# Low-Flow Test Report:

**Test Date / Time:** 11/30/2018 10:46:07 AM

**Project:** Edmonds Terminal 4Q18

**Operator Name:** KF

<p><b>Location Name: MW-521</b>  <b>Well Diameter: 2 in</b>  <b>Casing Type: PVC</b>  <b>Screen Length: 10 ft</b>  <b>Top of Screen: 3 ft</b>  <b>Total Depth: 13 ft</b>  <b>Initial Depth to Water: 6.65 ft</b></p>	<p><b>Pump Type: Geotech geopump Series 2</b>  <b>Tubing Type: Polyethylene 0.170" x 1/4"</b>  <b>Pump Intake From TOC: 8 ft</b>  <b>Estimated Total Volume Pumped: 4050 ml</b>  <b>Flow Cell Volume: 130 ml</b>  <b>Final Flow Rate: 150 ml/min</b>  <b>Final Draw Down: 0 ft</b></p>	<p><b>Instrument Used: Aqua TROLL 600 Vented</b>  <b>Serial Number: 565206</b></p>
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## Test Notes:

## Weather Conditions:

Overcast

47°F

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15 %		
11/30/2018 10:46 AM	00:00	6.99 pH	53.29 °F	324.76 µS/cm	7.42 mg/L	0.31 NTU	-49.1 mV	6.65 ft	150.00 ml/min
11/30/2018 10:49 AM	03:00	7.01 pH	52.85 °F	329.26 µS/cm	6.63 mg/L	0.38 NTU	-2.2 mV	6.65 ft	150.00 ml/min
11/30/2018 10:52 AM	06:00	7.01 pH	52.72 °F	328.14 µS/cm	6.57 mg/L	0.00 NTU	25.1 mV	6.65 ft	150.00 ml/min
11/30/2018 10:55 AM	09:00	7.03 pH	52.22 °F	327.93 µS/cm	6.53 mg/L	0.00 NTU	44.4 mV	6.65 ft	150.00 ml/min
11/30/2018 10:58 AM	12:00	7.02 pH	52.31 °F	326.79 µS/cm	6.47 mg/L	0.00 NTU	58.8 mV	6.65 ft	150.00 ml/min
11/30/2018 11:01 AM	15:00	7.03 pH	52.08 °F	323.79 µS/cm	6.46 mg/L	0.00 NTU	66.9 mV	6.65 ft	150.00 ml/min
11/30/2018 11:04 AM	18:00	7.02 pH	52.12 °F	322.96 µS/cm	6.44 mg/L	0.00 NTU	77.5 mV	6.65 ft	150.00 ml/min
11/30/2018 11:07 AM	21:00	7.02 pH	52.17 °F	319.15 µS/cm	6.43 mg/L	0.00 NTU	83.7 mV	6.65 ft	150.00 ml/min
11/30/2018 11:10 AM	24:00	7.03 pH	52.05 °F	315.71 µS/cm	6.40 mg/L	0.00 NTU	91.6 mV	6.65 ft	150.00 ml/min
11/30/2018 11:13 AM	27:00	7.02 pH	52.16 °F	314.57 µS/cm	6.34 mg/L	0.00 NTU	94.9 mV	6.65 ft	150.00 ml/min

**Samples**

Sample ID:	Description:
MW-521	Final DTW:5.61 Iron:0.5 mg/L Sample Time: 1120



# Low-Flow Test Report:

**Test Date / Time:** 2/7/2019 12:34:28 PM  
**Project:** Edmonds Terminal 1Q19 resample  
**Operator Name:** EK

<b>Location Name: MW-101</b> <b>Well Diameter: 2 in</b> <b>Casing Type: PVC</b> <b>Screen Length: 10 ft</b> <b>Top of Screen: 5 ft</b> <b>Total Depth: 15 ft</b> <b>Initial Depth to Water: 8.65 ft</b>	<b>Pump Type: Geotech geopump series 1</b> <b>Tubing Type: Polyethylene 0.170" x 1/4"</b> <b>Pump Intake From TOC: 11.5 ft</b> <b>Estimated Total Volume Pumped: 3000 ml</b> <b>Flow Cell Volume: 130 ml</b> <b>Final Flow Rate: 200 ml/min</b> <b>Final Draw Down: 0.02 ft</b>	<b>Instrument Used: Aqua TROLL 600 Vented</b> <b>Serial Number: 469050</b>
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## Test Notes:

**Weather Conditions:**  
 30 and Sunny

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15 %		
2/7/2019 12:34 PM	00:00	6.59 pH	50.38 °F	216.07 µS/cm	6.67 mg/L	26.13 NTU	47.8 mV	8.65 ft	200.00 ml/min
2/7/2019 12:37 PM	03:00	6.65 pH	50.08 °F	216.66 µS/cm	6.67 mg/L	0.80 NTU	57.8 mV	8.65 ft	200.00 ml/min
2/7/2019 12:40 PM	06:00	6.66 pH	50.21 °F	214.99 µS/cm	6.71 mg/L	0.00 NTU	65.4 mV	8.65 ft	200.00 ml/min
2/7/2019 12:43 PM	09:00	6.61 pH	50.41 °F	212.91 µS/cm	6.83 mg/L	0.00 NTU	75.1 mV	8.65 ft	200.00 ml/min
2/7/2019 12:46 PM	12:00	6.64 pH	50.63 °F	215.83 µS/cm	6.73 mg/L	0.00 NTU	78.7 mV	8.65 ft	200.00 ml/min
2/7/2019 12:49 PM	15:00	6.63 pH	50.54 °F	213.73 µS/cm	6.84 mg/L	2.07 NTU	83.8 mV	8.65 ft	200.00 ml/min

## Samples

Sample ID:	Description:
MW-101	Sample time 1150 Final DTW 8.85 ft btoc

# Low-Flow Test Report:

**Test Date / Time:** 2/7/2019 10:21:49 AM

**Project:** Edmonds Terminal 1Q19 Resample

**Operator Name:** KF

<p><b>Location Name:</b> MW-129R  <b>Well Diameter:</b> 2 in  <b>Casing Type:</b> PVC  <b>Screen Length:</b> 10 ft  <b>Top of Screen:</b> 3 ft  <b>Total Depth:</b> 13 ft  <b>Initial Depth to Water:</b> 5.64 ft</p>	<p><b>Pump Type:</b> Geotech geopump Series 2  <b>Tubing Type:</b> Polyethylene 0.170" x 1/4"  <b>Pump Intake From TOC:</b> 9 ft  <b>Estimated Total Volume Pumped:</b> 5850 ml  <b>Flow Cell Volume:</b> 130 ml  <b>Final Flow Rate:</b> 150 ml/min  <b>Final Draw Down:</b> 0.29 ft</p>	<p><b>Instrument Used:</b> Aqua TROLL 600 Vented  <b>Serial Number:</b> 565206</p>
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## Test Notes:

## Weather Conditions:

27F

Sunny

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15 %		
2/7/2019 10:21 AM	00:00	6.71 pH	46.31 °F	1,280.0 µS/cm	1.80 mg/L	0.00 NTU	-77.5 mV	5.64 ft	150.00 ml/min
2/7/2019 10:24 AM	03:00	6.72 pH	46.65 °F	1,279.2 µS/cm	0.67 mg/L	0.43 NTU	-85.5 mV	5.64 ft	150.00 ml/min
2/7/2019 10:27 AM	06:00	6.73 pH	47.00 °F	1,302.1 µS/cm	0.49 mg/L	1.04 NTU	-86.5 mV	5.64 ft	150.00 ml/min
2/7/2019 10:30 AM	09:00	6.73 pH	47.36 °F	1,303.2 µS/cm	0.35 mg/L	1.36 NTU	-94.9 mV	5.64 ft	150.00 ml/min
2/7/2019 10:33 AM	12:00	6.73 pH	47.41 °F	1,311.4 µS/cm	0.28 mg/L	2.02 NTU	-95.1 mV	5.64 ft	150.00 ml/min
2/7/2019 10:36 AM	15:00	6.72 pH	47.69 °F	1,308.2 µS/cm	0.23 mg/L	3.02 NTU	-102.5 mV	5.64 ft	150.00 ml/min
2/7/2019 10:39 AM	18:00	6.72 pH	47.87 °F	1,306.5 µS/cm	0.19 mg/L	2.52 NTU	-101.6 mV	5.64 ft	150.00 ml/min
2/7/2019 10:42 AM	21:00	6.72 pH	48.18 °F	1,302.5 µS/cm	0.15 mg/L	2.93 NTU	-108.6 mV	5.64 ft	150.00 ml/min
2/7/2019 10:45 AM	24:00	6.72 pH	48.29 °F	1,304.3 µS/cm	0.15 mg/L	3.50 NTU	-108.2 mV	5.64 ft	150.00 ml/min
2/7/2019 10:48 AM	27:00	6.72 pH	48.50 °F	1,304.1 µS/cm	0.13 mg/L	3.81 NTU	-112.8 mV	5.64 ft	150.00 ml/min
2/7/2019 10:51 AM	30:00	6.72 pH	48.54 °F	1,301.5 µS/cm	0.13 mg/L	4.49 NTU	-112.8 mV	5.64 ft	150.00 ml/min

2/7/2019 10:54 AM	33:00	6.71 pH	48.94 °F	1,292.1 µS/cm	0.10 mg/L	3.99 NTU	-116.4 mV	5.64 ft	150.00 ml/min
2/7/2019 10:57 AM	36:00	6.72 pH	48.85 °F	1,291.7 µS/cm	0.10 mg/L	3.96 NTU	-116.7 mV	5.64 ft	150.00 ml/min
2/7/2019 11:00 AM	39:00	6.72 pH	48.84 °F	1,302.7 µS/cm	0.10 mg/L	4.75 NTU	-119.7 mV	5.64 ft	150.00 ml/min

## Samples

Sample ID:	Description:
MW-129R	Sample time: 1000 Final DTW: 5.93 Sample
MW-129R-MS/MSD	times: 1001,1002

# Low-Flow Test Report:

**Test Date / Time:** 2/7/2019 11:58:17 AM  
**Project:** Edmonds Terminal 1Q19 Resample  
**Operator Name:** KF

<b>Location Name: MW-518</b> <b>Well Diameter: 2 in</b> <b>Casing Type: PVC</b> <b>Screen Length: 10 ft</b> <b>Top of Screen: 2.5 ft</b> <b>Total Depth: 12.5 ft</b> <b>Initial Depth to Water: 8.24 ft</b>	<b>Pump Type: Geotech geopump Series 2</b> <b>Tubing Type: Polyethylene 0.170" x 1/4"</b> <b>Pump Intake From TOC: 10.5 ft</b> <b>Estimated Total Volume Pumped: 5850 ml</b> <b>Flow Cell Volume: 130 ml</b> <b>Final Flow Rate: 150 ml/min</b> <b>Final Draw Down: 0.12 ft</b>	<b>Instrument Used: Aqua TROLL 600 Vented</b> <b>Serial Number: 565206</b>
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## Test Notes:

## Weather Conditions:

23F  
 Sunny

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15 %		
2/7/2019 11:58 AM	00:00	6.94 pH	51.23 °F	1,069.5 µS/cm	1.48 mg/L	12.64 NTU	7.4 mV	8.24 ft	150.00 ml/min
2/7/2019 12:01 PM	03:00	6.88 pH	51.92 °F	1,070.4 µS/cm	0.32 mg/L	19.97 NTU	8.5 mV	8.24 ft	150.00 ml/min
2/7/2019 12:04 PM	06:00	6.85 pH	52.22 °F	1,104.2 µS/cm	0.25 mg/L	3.13 NTU	11.7 mV	8.24 ft	150.00 ml/min
2/7/2019 12:07 PM	09:00	6.86 pH	52.39 °F	1,115.1 µS/cm	0.21 mg/L	3.23 NTU	3.5 mV	8.24 ft	150.00 ml/min
2/7/2019 12:10 PM	12:00	6.86 pH	52.50 °F	1,147.4 µS/cm	0.24 mg/L	1.82 NTU	-0.2 mV	8.24 ft	150.00 ml/min
2/7/2019 12:13 PM	15:00	6.85 pH	52.32 °F	1,136.5 µS/cm	0.25 mg/L	5.71 NTU	-7.1 mV	8.24 ft	150.00 ml/min
2/7/2019 12:16 PM	18:00	6.84 pH	52.19 °F	1,128.7 µS/cm	0.25 mg/L	3.84 NTU	-10.4 mV	8.24 ft	150.00 ml/min
2/7/2019 12:19 PM	21:00	6.85 pH	52.23 °F	1,139.1 µS/cm	0.22 mg/L	3.51 NTU	-15.9 mV	8.24 ft	150.00 ml/min
2/7/2019 12:22 PM	24:00	6.84 pH	52.49 °F	1,125.6 µS/cm	0.23 mg/L	2.92 NTU	-17.7 mV	8.24 ft	150.00 ml/min
2/7/2019 12:25 PM	27:00	6.85 pH	52.36 °F	1,124.7 µS/cm	0.21 mg/L	3.03 NTU	-23.6 mV	8.24 ft	150.00 ml/min
2/7/2019 12:28 PM	30:00	6.86 pH	52.66 °F	1,114.7 µS/cm	0.21 mg/L	2.56 NTU	-26.6 mV	8.24 ft	150.00 ml/min
2/7/2019 12:31 PM	33:00	6.85 pH	52.65 °F	1,123.5 µS/cm	0.24 mg/L	2.85 NTU	-31.6 mV	8.24 ft	150.00 ml/min

2/7/2019 12:34 PM	36:00	6.85 pH	52.86 °F	1,104.8 µS/cm	0.25 mg/L	2.98 NTU	-31.9 mV	8.24 ft	150.00 ml/min
2/7/2019 12:37 PM	39:00	6.85 pH	52.79 °F	1,102.0 µS/cm	0.28 mg/L	3.38 NTU	-33.4 mV	8.24 ft	150.00 ml/min

## Samples

Sample ID:	Description:
MW-518	Sample time: 1145 Final DTW: 8.36

# Low-Flow Test Report:

**Test Date / Time:** 2/7/2019 11:27:10 AM  
**Project:** Edmonds Terminal 1Q19 resample  
**Operator Name:** EK

<b>Location Name: MW-526</b> <b>Well Diameter: 2 in</b> <b>Casing Type: PVC</b> <b>Screen Length: 10 ft</b> <b>Top of Screen: 3 ft</b> <b>Total Depth: 13 ft</b> <b>Initial Depth to Water: 5.4 ft</b>	<b>Pump Type: Geotech geopump series 1</b> <b>Tubing Type: Polyethylene 0.170" x 1/4"</b> <b>Pump Intake From TOC: 9 ft</b> <b>Estimated Total Volume Pumped: 6000 ml</b> <b>Flow Cell Volume: 130 ml</b> <b>Final Flow Rate: 200 ml/min</b> <b>Final Draw Down: 0.06 ft</b>	<b>Instrument Used: Aqua TROLL 600 Vented</b> <b>Serial Number: 469050</b>
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## Test Notes:

**Weather Conditions:**  
 30 and Sunny

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15 %		
2/7/2019 11:27 AM	00:00	6.36 pH	47.46 °F	244.35 µS/cm	0.35 mg/L	287.86 NTU	30.8 mV	5.40 ft	200.00 ml/min
2/7/2019 11:30 AM	03:00	6.27 pH	47.98 °F	237.37 µS/cm	0.19 mg/L	283.72 NTU	39.1 mV	5.40 ft	200.00 ml/min
2/7/2019 11:33 AM	06:00	6.24 pH	47.92 °F	233.76 µS/cm	0.16 mg/L	294.17 NTU	49.0 mV	5.40 ft	200.00 ml/min
2/7/2019 11:36 AM	09:00	6.22 pH	47.98 °F	222.19 µS/cm	0.16 mg/L	286.05 NTU	55.9 mV	5.40 ft	200.00 ml/min
2/7/2019 11:39 AM	12:00	6.20 pH	48.01 °F	219.75 µS/cm	0.19 mg/L	265.85 NTU	58.0 mV	5.40 ft	200.00 ml/min
2/7/2019 11:42 AM	15:00	6.19 pH	47.88 °F	197.52 µS/cm	0.25 mg/L	261.26 NTU	60.3 mV	5.40 ft	200.00 ml/min
2/7/2019 11:45 AM	18:00	6.17 pH	47.68 °F	204.67 µS/cm	0.28 mg/L	251.18 NTU	63.1 mV	5.40 ft	200.00 ml/min
2/7/2019 11:48 AM	21:00	6.17 pH	47.69 °F	200.80 µS/cm	0.31 mg/L	255.92 NTU	63.7 mV	5.40 ft	200.00 ml/min
2/7/2019 11:51 AM	24:00	6.17 pH	47.77 °F	203.60 µS/cm	0.26 mg/L	266.07 NTU	62.8 mV	5.40 ft	200.00 ml/min
2/7/2019 11:54 AM	27:00	6.17 pH	47.82 °F	208.89 µS/cm	0.25 mg/L	271.33 NTU	63.0 mV	5.40 ft	200.00 ml/min
2/7/2019 11:57 AM	30:00	6.18 pH	47.83 °F	214.61 µS/cm	0.24 mg/L	269.41 NTU	62.8 mV	5.40 ft	200.00 ml/min

**Samples**

Sample ID:	Description:
MW-526	Sample time 1100 Final DTW 6.00 ft btoc

# Low-Flow Test Report:

**Test Date / Time:** 2/7/2019 10:05:31 AM  
**Project:** Edmonds Terminal 1Q19 resample  
**Operator Name:** EK

<p><b>Location Name:</b> MW-E-R  <b>Well Diameter:</b> 2 in  <b>Casing Type:</b> PVC  <b>Screen Length:</b> 10 ft  <b>Top of Screen:</b> 3 ft  <b>Total Depth:</b> 13 ft  <b>Initial Depth to Water:</b> 7.1 ft</p>	<p><b>Pump Type:</b> Geotech geopump series 1  <b>Tubing Type:</b> Polyethylene 0.170" x 1/4"  <b>Pump Intake From TOC:</b> 10 ft  <b>Estimated Total Volume Pumped:</b> 7800 ml  <b>Flow Cell Volume:</b> 130 ml  <b>Final Flow Rate:</b> 200 ml/min  <b>Final Draw Down:</b> 0.05 ft</p>	<p><b>Instrument Used:</b> Aqua TROLL 600 Vented  <b>Serial Number:</b> 469050</p>
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## Test Notes:

**Weather Conditions:**  
30 and sunny

## Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 10 %	+/- 10 %	+/- 10 %	+/- 15 %	+/- 10 %	+/- 15 %		
2/7/2019 10:05 AM	00:00	6.52 pH	44.33 °F	1,745.6 µS/cm	1.74 mg/L	3.26 NTU	-60.4 mV	7.10 ft	200.00 ml/min
2/7/2019 10:08 AM	03:00	6.55 pH	46.37 °F	1,717.1 µS/cm	0.37 mg/L	2.78 NTU	-81.5 mV	7.10 ft	200.00 ml/min
2/7/2019 10:11 AM	06:00	6.56 pH	47.32 °F	1,697.4 µS/cm	0.22 mg/L	4.81 NTU	-90.0 mV	7.10 ft	200.00 ml/min
2/7/2019 10:14 AM	09:00	6.57 pH	47.89 °F	1,685.7 µS/cm	0.19 mg/L	0.38 NTU	-92.3 mV	7.10 ft	200.00 ml/min
2/7/2019 10:17 AM	12:00	6.56 pH	48.14 °F	1,684.1 µS/cm	0.12 mg/L	0.06 NTU	-97.3 mV	7.10 ft	200.00 ml/min
2/7/2019 10:20 AM	15:00	6.56 pH	48.79 °F	1,669.2 µS/cm	0.10 mg/L	2.52 NTU	-100.9 mV	7.10 ft	200.00 ml/min
2/7/2019 10:23 AM	18:00	6.57 pH	48.93 °F	1,668.7 µS/cm	0.06 mg/L	0.00 NTU	-105.0 mV	7.10 ft	200.00 ml/min
2/7/2019 10:26 AM	21:00	6.57 pH	49.39 °F	1,665.5 µS/cm	0.06 mg/L	0.00 NTU	-107.8 mV	7.10 ft	200.00 ml/min
2/7/2019 10:29 AM	24:00	6.56 pH	49.38 °F	1,657.3 µS/cm	0.05 mg/L	0.00 NTU	-110.2 mV	7.10 ft	200.00 ml/min
2/7/2019 10:32 AM	27:00	6.56 pH	49.62 °F	1,649.7 µS/cm	0.04 mg/L	0.00 NTU	-113.7 mV	7.10 ft	200.00 ml/min
2/7/2019 10:35 AM	30:00	6.56 pH	49.67 °F	1,600.8 µS/cm	0.03 mg/L	0.00 NTU	-115.2 mV	7.10 ft	200.00 ml/min
2/7/2019 10:38 AM	33:00	6.56 pH	49.94 °F	1,645.0 µS/cm	0.02 mg/L	0.00 NTU	-116.7 mV	7.10 ft	200.00 ml/min



2/7/2019 10:41 AM	36:00	6.56 pH	50.12 °F	1,487.2 µS/cm	0.02 mg/L	0.00 NTU	-118.2 mV	7.10 ft	200.00 ml/min
2/7/2019 10:44 AM	39:00	6.56 pH	50.14 °F	1,636.2 µS/cm	0.02 mg/L	0.00 NTU	-119.5 mV	7.10 ft	200.00 ml/min

## Samples

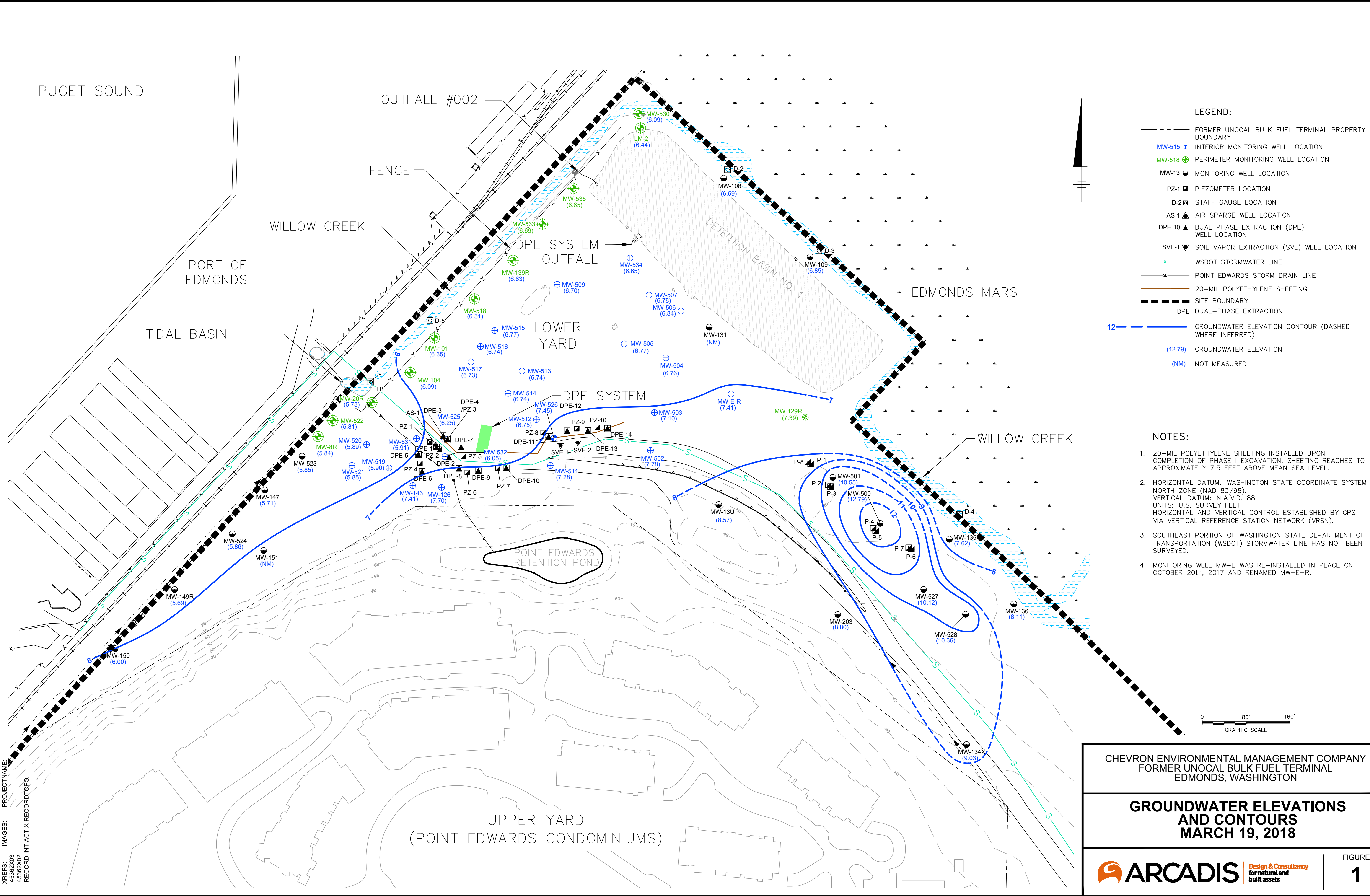
Sample ID:	Description:
MW-E-R	Sample time 0950 Final DTW 7.60 ft btoc
DUP-1	

# APPENDIX C

## Groundwater Sampling Event Figures

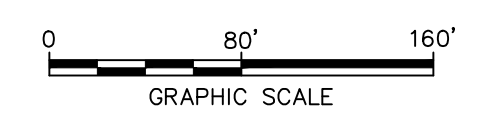


CITY: MINNEAPOLIS, MN DIV/GROUP: ENV/CAD DB: R. OBERLANDER LD: R. OBERLANDER PIC: (Opt) PK: (Reop) TM: (Opt) Lyr: (Opt) OFF: (REF)  
 D:\PROJECTS\333 Edmonds Figures\Drawings\PUBLIC REVIEW DRAFT\03-X - Mar -19.dwg LAYOUT: 1. Saved: 4/9/2018 2:30 PM ACADVER: 21.05 (LMS TECH) PAGES: 1 OF 1 PLOTTED: 4/9/2018 3:04 PM BY: ANJANEYAKUMAR, PAVAN KUMAR



- LEGEND:**
- FORMER UNOCAL BULK FUEL TERMINAL PROPERTY BOUNDARY
  - MW-515 ⊕ INTERIOR MONITORING WELL LOCATION
  - MW-518 ⊕ PERIMETER MONITORING WELL LOCATION
  - MW-13 ⊕ MONITORING WELL LOCATION
  - PZ-1 ⊕ PIEZOMETER LOCATION
  - D-2 ⊕ STAFF GAUGE LOCATION
  - AS-1 ⊕ AIR SPARGE WELL LOCATION
  - DPE-10 ⊕ DUAL PHASE EXTRACTION (DPE) WELL LOCATION
  - SVE-1 ⊕ SOIL VAPOR EXTRACTION (SVE) WELL LOCATION
  - WSDOT STORMWATER LINE
  - POINT EDWARDS STORM DRAIN LINE
  - 20-MIL POLYETHYLENE SHEETING
  - SITE BOUNDARY
  - DPE DUAL-PHASE EXTRACTION
  - GROUNDWATER ELEVATION CONTOUR (DASHED WHERE INFERRED)
  - (12.79) GROUNDWATER ELEVATION
  - (NM) NOT MEASURED

- NOTES:**
1. 20-MIL POLYETHYLENE SHEETING INSTALLED UPON COMPLETION OF PHASE I EXCAVATION. SHEETING REACHES TO APPROXIMATELY 7.5 FEET ABOVE MEAN SEA LEVEL.
  2. HORIZONTAL DATUM: WASHINGTON STATE COORDINATE SYSTEM NORTH ZONE (NAD 83/98).  
 VERTICAL DATUM: N.A.V.D. 88  
 UNITS: U.S. SURVEY FEET  
 HORIZONTAL AND VERTICAL CONTROL ESTABLISHED BY GPS VIA VERTICAL REFERENCE STATION NETWORK (VRSN).
  3. SOUTHEAST PORTION OF WASHINGTON STATE DEPARTMENT OF TRANSPORTATION (WSDOT) STORMWATER LINE HAS NOT BEEN SURVEYED.
  4. MONITORING WELL MW-E WAS RE-INSTALLED IN PLACE ON OCTOBER 20th, 2017 AND RENAMED MW-E-R.



CHEVRON ENVIRONMENTAL MANAGEMENT COMPANY  
 FORMER UNOCAL BULK FUEL TERMINAL  
 EDMONDS, WASHINGTON

**GROUNDWATER ELEVATIONS  
 AND CONTOURS  
 MARCH 19, 2018**

**ARCADIS** Design & Consultancy  
 for natural and built assets

FIGURE  
**1**

CITY: MINNEAPOLIS, MN DIV:GROUP: ENV/CAD DB: R. OBERLANDER LD: R. OBERLANDER PIC:(Opt) PK:(Ref) TM:(Opt) LYR:(Opt) OFF:REF-  
D:\PROJECTS\333 Edmond Figures\Drawings\PUBLIC REVIEW DRAFT\03-X-TPH.dwg LAYOUT: 2 SAVED: 4/11/2018 6:12 PM ACADVER: 21.0S (LMS TECH) PAGES: 2 OF 2 PLOTTED: 4/12/2018 6:23 PM BY: ANJANEYAKUMAR, PAVAN KUMAR  
XREFS: IMAGES: PROJECTNAME: RECORD-INT-ACT-X-RECORD\TOPO

PUGET SOUND

OUTFALL #002

FENCE

WILLOW CREEK

PORT OF EDMONDS

TIDAL BASIN

LOWER YARD

DPE SYSTEM

POINT EDWARDS RETENTION POND

UPPER YARD (POINT EDWARDS CONDOMINIUMS)

DETENTION BASIN NO. 1

EDMONDS MARSH

WILLOW CREEK

LEGEND:

- FORMER UNOCAL BULK FUEL TERMINAL PROPERTY BOUNDARY
- MW-515 INTERIOR MONITORING WELL LOCATION
- PERIMETER MONITORING WELL LOCATION
- MW-13 MONITORING WELL LOCATION
- PZ-1 PIEZOMETER LOCATION
- D-2 STAFF GAUGE LOCATION
- AS-1 AIR SPARGE WELL LOCATION
- DPE-10 DUAL PHASE EXTRACTION (DPE) WELL LOCATION
- SVE-1 SOIL VAPOR EXTRACTION (SVE) WELL LOCATION
- WSDOT STORMWATER LINE
- POINT EDWARDS STORM DRAIN LINE
- 20-MIL POLYETHYLENE SHEETING
- SITE BOUNDARY
- DPE DUAL-PHASE EXTRACTION
- (2,060) TOTAL PETROLEUM HYDROCARBON (TPH) CONCENTRATION IN MICROGRAMS PER LITER
- HIGHLIGHTED CONCENTRATIONS EXCEED SAMPLE SPECIFIC TPH CLEANUP LEVEL
- UU THE CONSTITUENTS MAKING UP THE TOTAL ARE ALL NON-DETECTS
- (NS) NOT SAMPLED

NOTES:

1. 20-MIL POLYETHYLENE SHEETING INSTALLED UPON COMPLETION OF PHASE I EXCAVATION. SHEETING REACHES TO APPROXIMATELY 7.5 FEET ABOVE MEAN SEA LEVEL.
2. HORIZONTAL DATUM: WASHINGTON STATE COORDINATE SYSTEM NORTH ZONE (NAD 83/98). VERTICAL DATUM: N.A.V.D. 88. UNITS: U.S. SURVEY FEET. HORIZONTAL AND VERTICAL CONTROL ESTABLISHED BY GPS VIA VERTICAL REFERENCE STATION NETWORK (VRSN).
3. SOUTHEAST PORTION OF WASHINGTON STATE DEPARTMENT OF TRANSPORTATION (WSDOT) STORMWATER LINE HAS NOT BEEN SURVEYED.
4. MONITORING WELL MW-E WAS RE-INSTALLED IN PLACE ON OCTOBER 20th, 2017 AND RENAMED MW-E-R.

0 80' 160'  
GRAPHIC SCALE

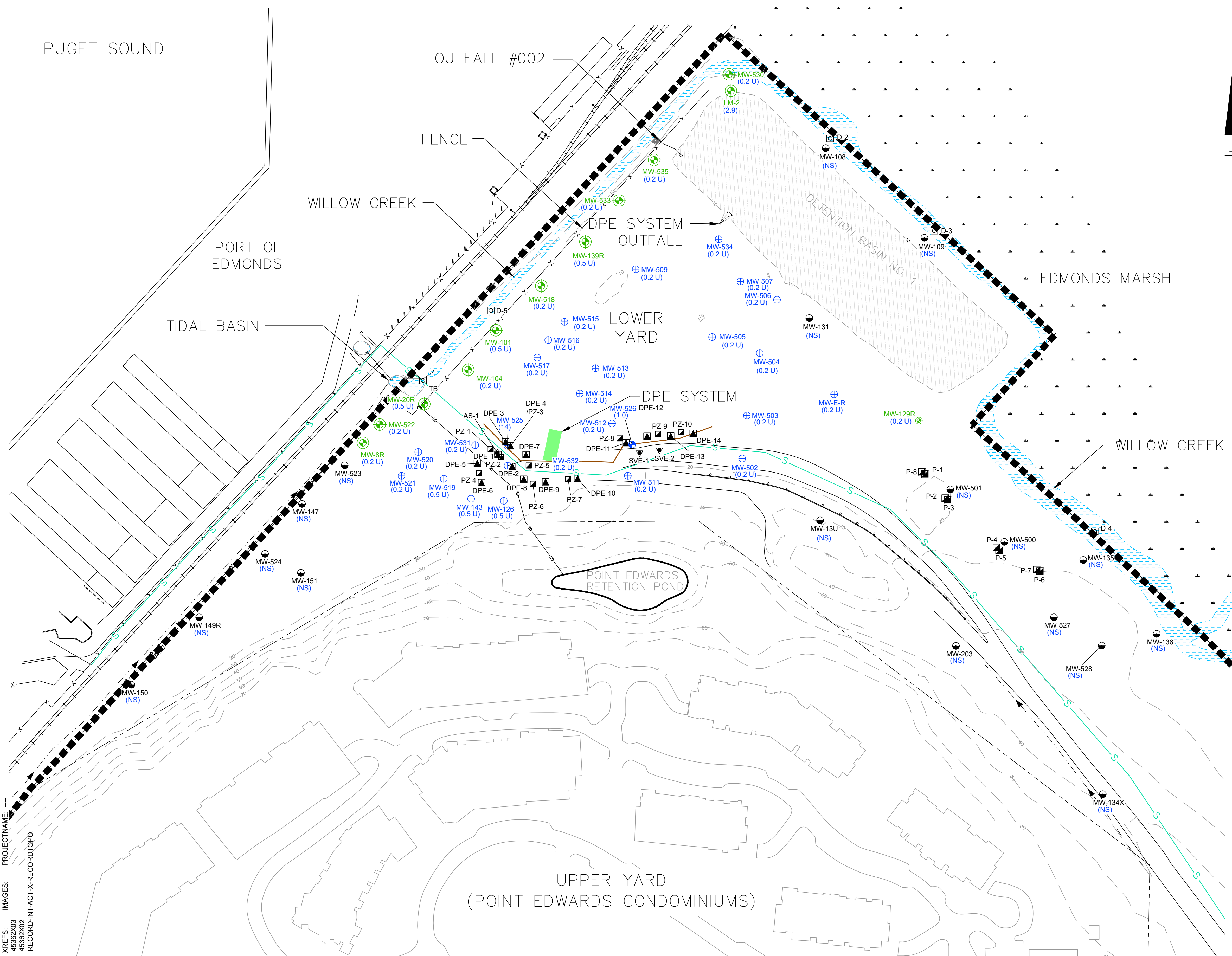
CHEVRON ENVIRONMENTAL MANAGEMENT COMPANY  
FORMER UNOCAL BULK FUEL TERMINAL  
EDMONDS, WASHINGTON

GROUNDWATER TPH  
CONCENTRATION  
MARCH 2018



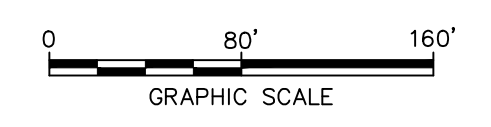
FIGURE  
2

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- LEGEND:**
- FORMER UNOCAL BULK FUEL TERMINAL PROPERTY BOUNDARY
  - MW-515 ⊕ INTERIOR MONITORING WELL LOCATION
  - MW-518 ⊕ PERIMETER MONITORING WELL LOCATION
  - MW-13 ⊙ MONITORING WELL LOCATION
  - PZ-1 ⊠ PIEZOMETER LOCATION
  - D-2 ⊠ STAFF GAUGE LOCATION
  - AS-1 ⊠ AIR SPARGE WELL LOCATION
  - DPE-10 ⊠ DUAL PHASE EXTRACTION (DPE) WELL LOCATION
  - SVE-1 ⊠ SOIL VAPOR EXTRACTION (SVE) WELL LOCATION
  - S WSDOT STORMWATER LINE
  - P POINT EDWARDS STORM DRAIN LINE
  - 20-MIL POLYETHYLENE SHEETING
  - SITE BOUNDARY
  - DPE DUAL-PHASE EXTRACTION
  - (14) BENZENE CONCENTRATION IN MICROGRAMS PER LITER (µg/L)
  - U NON DETECT
  - (NS) NOT SAMPLED

- NOTES:**
1. 20-MIL POLYETHYLENE SHEETING INSTALLED UPON COMPLETION OF PHASE I EXCAVATION. SHEETING REACHES TO APPROXIMATELY 7.5 FEET ABOVE MEAN SEA LEVEL.
  2. HORIZONTAL DATUM: WASHINGTON STATE COORDINATE SYSTEM NORTH ZONE (NAD 83/98).  
 VERTICAL DATUM: N.A.V.D. 88  
 UNITS: U.S. SURVEY FEET  
 HORIZONTAL AND VERTICAL CONTROL ESTABLISHED BY GPS VIA VERTICAL REFERENCE STATION NETWORK (VRSN).
  3. SOUTHEAST PORTION OF WASHINGTON STATE DEPARTMENT OF TRANSPORTATION (WSDOT) STORMWATER LINE HAS NOT BEEN SURVEYED.
  4. MONITORING WELL MW-E WAS RE-INSTALLED IN PLACE ON OCTOBER 20th, 2017 AND RENAMED MW-E-R.



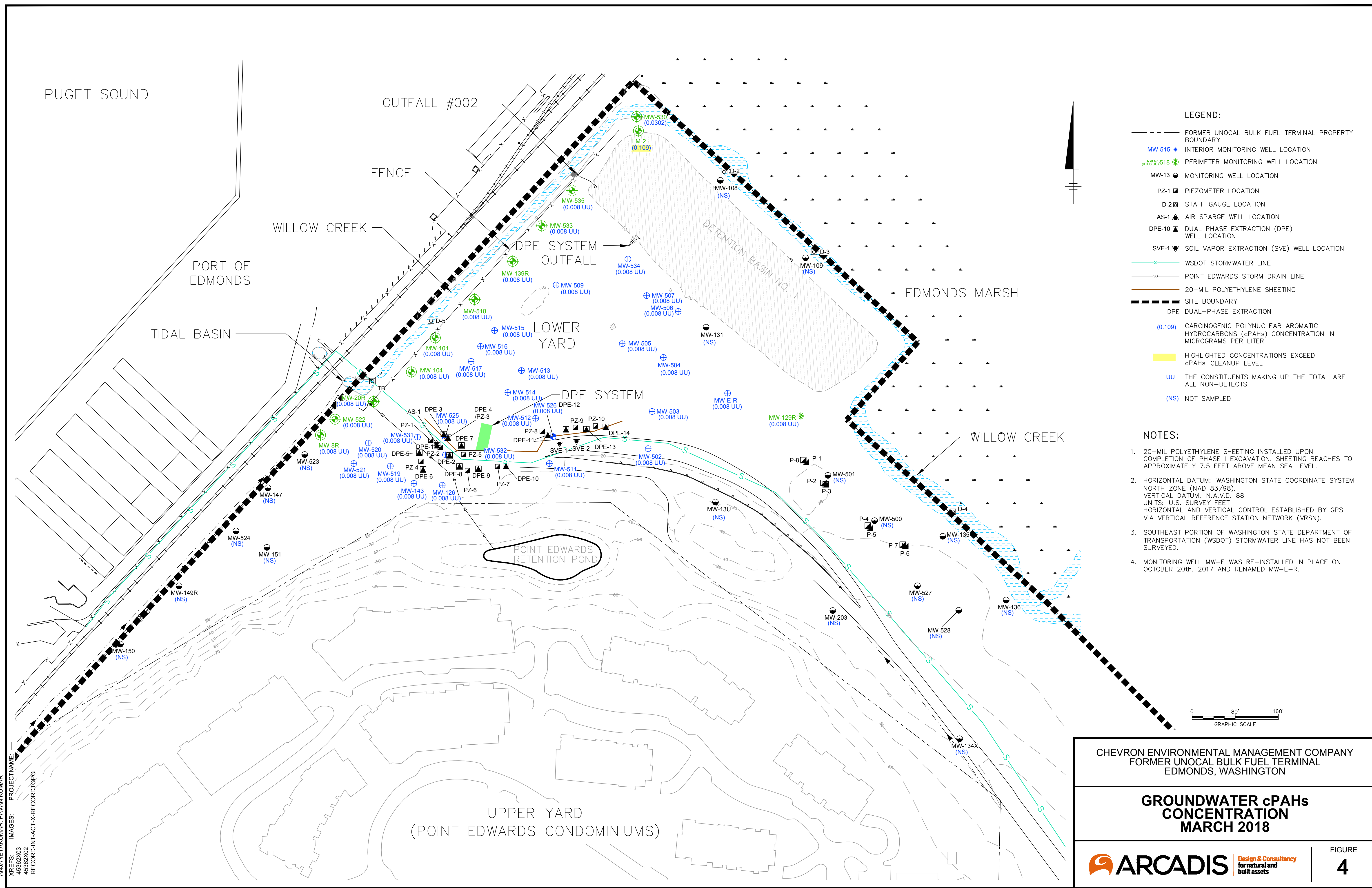
CHEVRON ENVIRONMENTAL MANAGEMENT COMPANY  
 FORMER UNOCAL BULK FUEL TERMINAL  
 EDMONDS, WASHINGTON

**GROUNDWATER BENZENE  
 CONCENTRATION  
 MARCH 2018**

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FIGURE  
**3**

CITY: MINNEAPOLIS, MN DIV/GROUP: ENV/CAD DB: R. OBERLANDER LD: P. OBERLANDER PIC: (Opt) PK: (Revd) TM: (Opt) LTR: (Opt) OFF: (REF)  
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- LEGEND:**
- FORMER UNOCAL BULK FUEL TERMINAL PROPERTY BOUNDARY
  - MW-515 ⊕ INTERIOR MONITORING WELL LOCATION
  - MW-518 ⊕ PERIMETER MONITORING WELL LOCATION
  - MW-13 ⊙ MONITORING WELL LOCATION
  - PZ-1 ⊠ PIEZOMETER LOCATION
  - D-2 ⊠ STAFF GAUGE LOCATION
  - AS-1 ⊠ AIR SPARGE WELL LOCATION
  - DPE-10 ⊠ DUAL PHASE EXTRACTION (DPE) WELL LOCATION
  - SVE-1 ⊠ SOIL VAPOR EXTRACTION (SVE) WELL LOCATION
  - WSDOT STORMWATER LINE
  - POINT EDWARDS STORM DRAIN LINE
  - 20-MIL POLYETHYLENE SHEETING
  - SITE BOUNDARY
  - DPE DUAL-PHASE EXTRACTION
  - (0.109) CARCINOGENIC POLYNUCLEAR AROMATIC HYDROCARBONS (cPAHs) CONCENTRATION IN MICROGRAMS PER LITER
  - Highlighted Concentrations Exceed cPAHs Cleanup Level
  - UU THE CONSTITUENTS MAKING UP THE TOTAL ARE ALL NON-DETECTS
  - (NS) NOT SAMPLED

- NOTES:**
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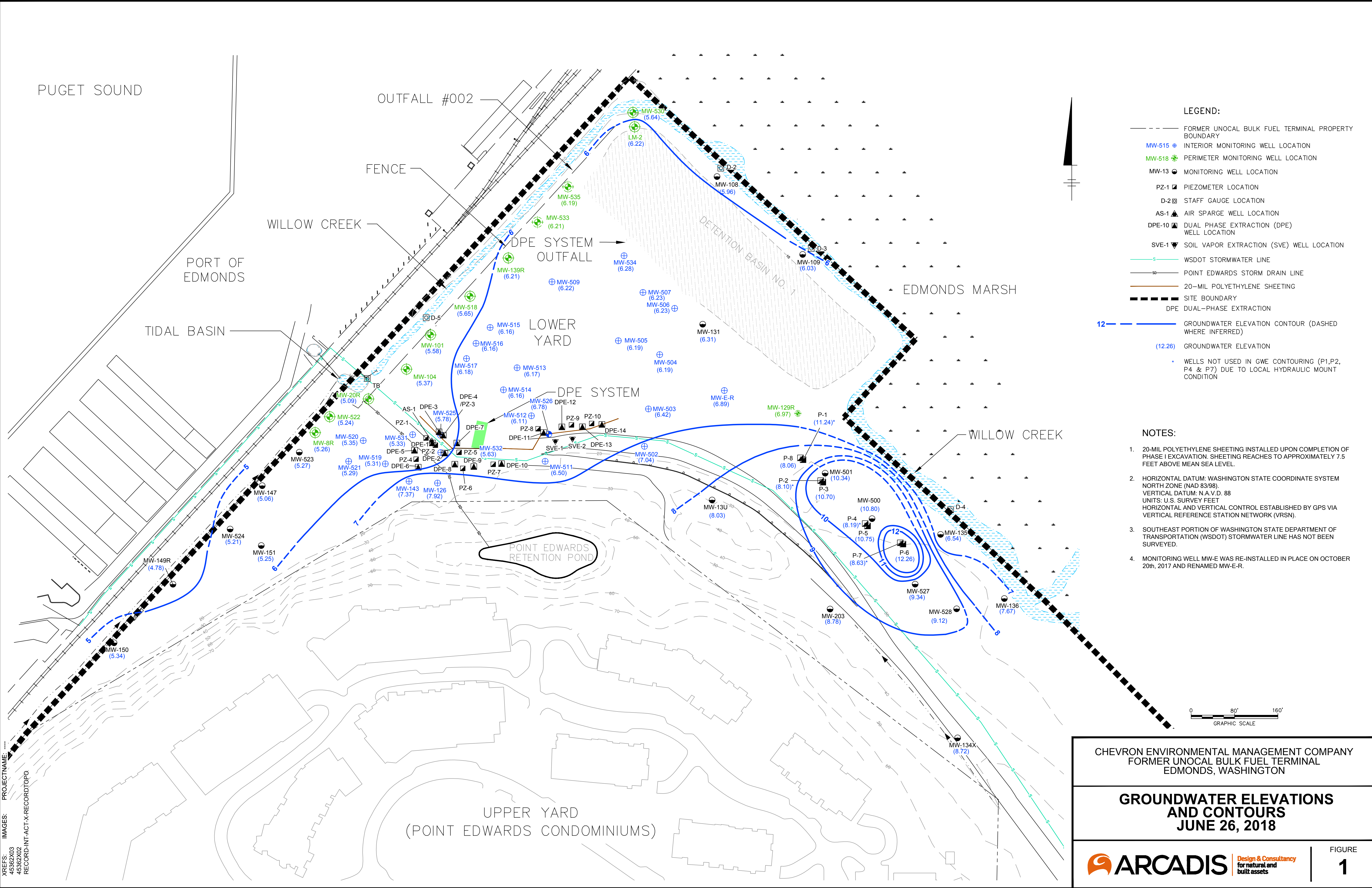
CHEVRON ENVIRONMENTAL MANAGEMENT COMPANY  
 FORMER UNOCAL BULK FUEL TERMINAL  
 EDMONDS, WASHINGTON

**GROUNDWATER cPAHs  
 CONCENTRATION  
 MARCH 2018**

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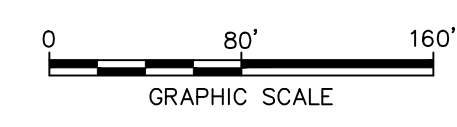
FIGURE  
**4**

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 45362X02



- LEGEND:**
- FORMER UNOCAL BULK FUEL TERMINAL PROPERTY BOUNDARY
  - MW-515 ⊕ INTERIOR MONITORING WELL LOCATION
  - MW-518 ⊕ PERIMETER MONITORING WELL LOCATION
  - MW-13 ⊕ MONITORING WELL LOCATION
  - PZ-1 ⊕ PIEZOMETER LOCATION
  - D-2 ⊕ STAFF GAUGE LOCATION
  - AS-1 ⊕ AIR SPARGE WELL LOCATION
  - DPE-10 ⊕ DUAL PHASE EXTRACTION (DPE) WELL LOCATION
  - SVE-1 ⊕ SOIL VAPOR EXTRACTION (SVE) WELL LOCATION
  - WSDOT STORMWATER LINE
  - POINT EDWARDS STORM DRAIN LINE
  - 20-MIL POLYETHYLENE SHEETING
  - SITE BOUNDARY
  - DPE DUAL-PHASE EXTRACTION
  - GROUNDWATER ELEVATION CONTOUR (DASHED WHERE INFERRED)
  - (12.26) GROUNDWATER ELEVATION
  - ⊕ WELLS NOT USED IN GWE CONTOURING (P1,P2, P4 & P7) DUE TO LOCAL HYDRAULIC MOUNT CONDITION

- NOTES:**
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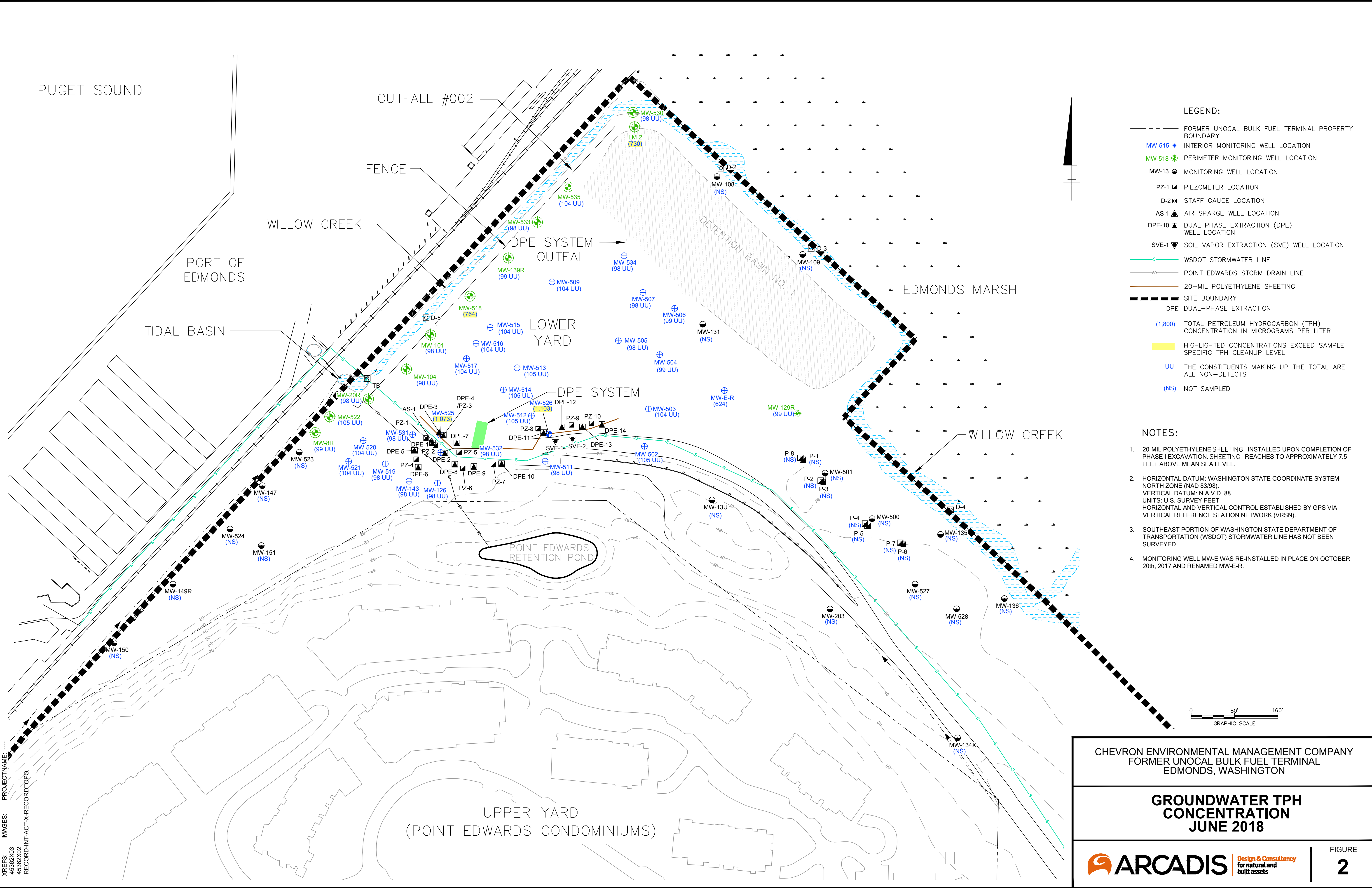
CHEVRON ENVIRONMENTAL MANAGEMENT COMPANY  
 FORMER UNOCAL BULK FUEL TERMINAL  
 EDMONDS, WASHINGTON

**GROUNDWATER ELEVATIONS  
 AND CONTOURS  
 JUNE 26, 2018**

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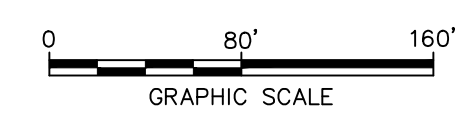
FIGURE  
**1**

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- LEGEND:**
- FORMER UNOCAL BULK FUEL TERMINAL PROPERTY BOUNDARY
  - MW-515 ⊕ INTERIOR MONITORING WELL LOCATION
  - MW-518 ⊕ PERIMETER MONITORING WELL LOCATION
  - MW-13 ⊙ MONITORING WELL LOCATION
  - PZ-1 ⊠ PIEZOMETER LOCATION
  - D-2 ⊕ STAFF GAUGE LOCATION
  - AS-1 ⊠ AIR SPARGE WELL LOCATION
  - DPE-10 ⊠ DUAL PHASE EXTRACTION (DPE) WELL LOCATION
  - SVE-1 ⊠ SOIL VAPOR EXTRACTION (SVE) WELL LOCATION
  - WSDOT STORMWATER LINE
  - POINT EDWARDS STORM DRAIN LINE
  - 20-MIL POLYETHYLENE SHEETING
  - SITE BOUNDARY
  - DPE DUAL-PHASE EXTRACTION
  - (1,800) TOTAL PETROLEUM HYDROCARBON (TPH) CONCENTRATION IN MICROGRAMS PER LITER
  - Highlighted Yellow Area HIGHLIGHTED CONCENTRATIONS EXCEED SAMPLE SPECIFIC TPH CLEANUP LEVEL
  - UU THE CONSTITUENTS MAKING UP THE TOTAL ARE ALL NON-DETECTS
  - (NS) NOT SAMPLED

- NOTES:**
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CHEVRON ENVIRONMENTAL MANAGEMENT COMPANY  
 FORMER UNOCAL BULK FUEL TERMINAL  
 EDMONDS, WASHINGTON

**GROUNDWATER TPH  
 CONCENTRATION  
 JUNE 2018**

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FIGURE  
**2**



CITY: MINNEAPOLIS, MN DIV: GROUP: ENV/CAD DB: R. OBERLANDER, LD: R. OBERLANDER, PIC: (Opt) PM: (Ref) TY: (Opt) LAY: (Opt) OFF: (Ref)  
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PUGET SOUND

OUTFALL #002

FENCE

WILLOW CREEK

PORT OF EDMONDS

TIDAL BASIN

DPE SYSTEM OUTFALL

LOWER YARD

DPE SYSTEM

POINT EDWARDS RETENTION POND

UPPER YARD  
(POINT EDWARDS CONDOMINIUMS)

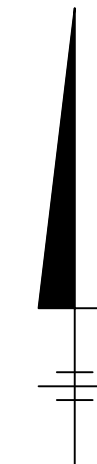
DETENTION BASIN NO. 1

EDMONDS MARSH

WILLOW CREEK

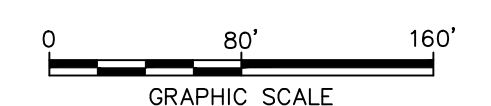
**LEGEND:**

- FORMER UNOCAL BULK FUEL TERMINAL PROPERTY BOUNDARY
- MW-515 ⊕ INTERIOR MONITORING WELL LOCATION
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- AS-1 ⊕ AIR SPARGE WELL LOCATION
- DPE-10 ⊕ DUAL PHASE EXTRACTION (DPE) WELL LOCATION
- SVE-1 ⊕ SOIL VAPOR EXTRACTION (SVE) WELL LOCATION
- - - WSDOT STORMWATER LINE
- - - POINT EDWARDS STORM DRAIN LINE
- 20-MIL POLYETHYLENE SHEETING
- - - SITE BOUNDARY
- - - DPE DUAL-PHASE EXTRACTION
- (6) BENZENE CONCENTRATION IN MICROGRAMS PER LITER (μg/L)
- U NON DETECT
- (NS) NOT SAMPLED



**NOTES:**

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VERTICAL DATUM: N.A.V.D. 88  
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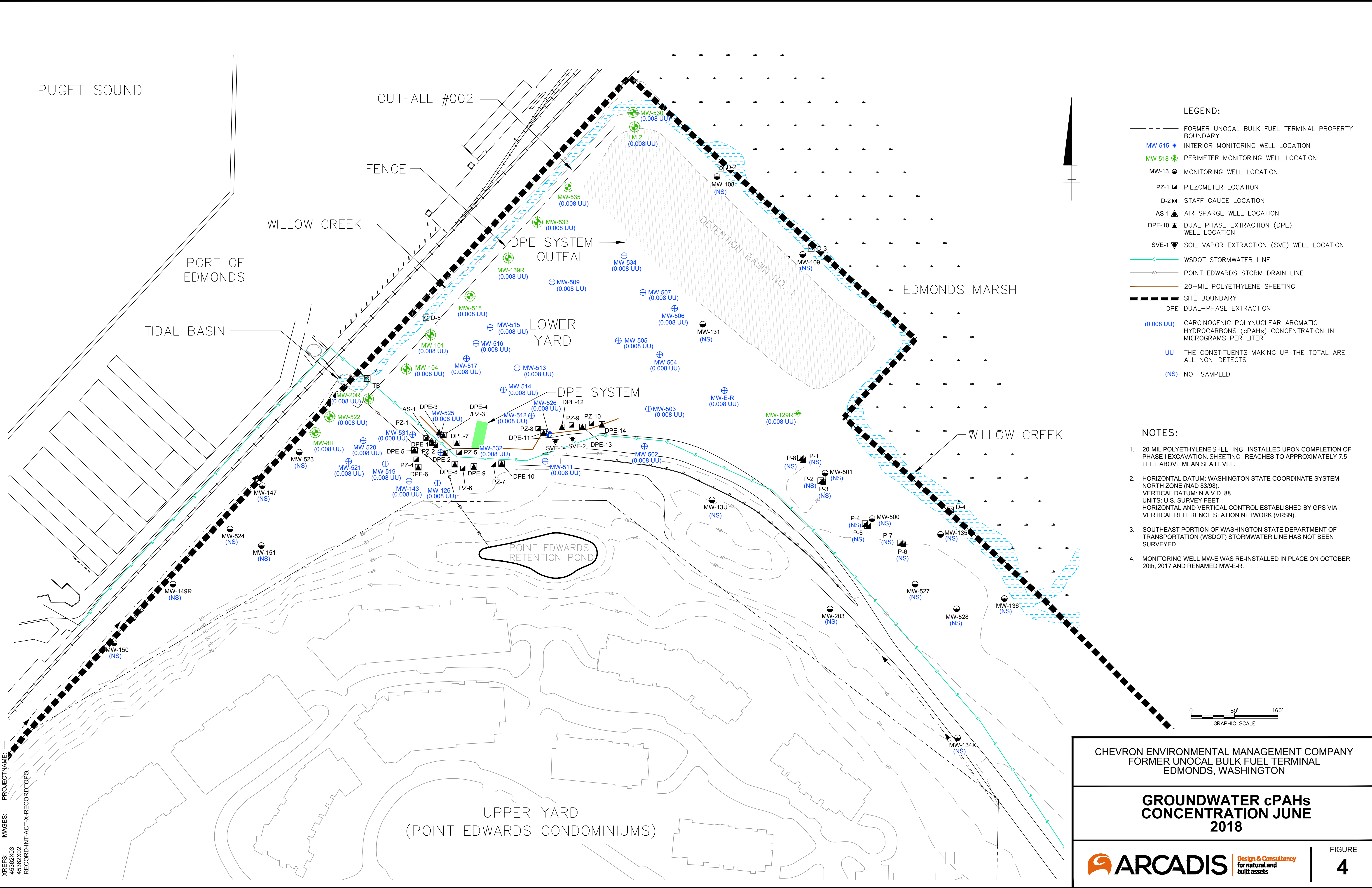


CHEVRON ENVIRONMENTAL MANAGEMENT COMPANY  
FORMER UNOCAL BULK FUEL TERMINAL  
EDMONDS, WASHINGTON

**GROUNDWATER BENZENE  
CONCENTRATION  
JUNE 2018**

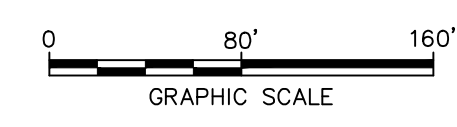
FIGURE  
**3**

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 XREFS: IMAGES: PROJECTNAME: RECORD-INT-ACT-X-RECORD/TOPO  
 45362X03  
 45362X02



- LEGEND:**
- FORMER UNOCAL BULK FUEL TERMINAL PROPERTY BOUNDARY
  - MW-515 ⊕ INTERIOR MONITORING WELL LOCATION
  - MW-518 ⊕ PERIMETER MONITORING WELL LOCATION
  - MW-13 ⊕ MONITORING WELL LOCATION
  - PZ-1 ⊕ PIEZOMETER LOCATION
  - D-2 ⊕ STAFF GAUGE LOCATION
  - AS-1 ⊕ AIR SPARGE WELL LOCATION
  - DPE-10 ⊕ DUAL PHASE EXTRACTION (DPE) WELL LOCATION
  - SVE-1 ⊕ SOIL VAPOR EXTRACTION (SVE) WELL LOCATION
  - WSDOT STORMWATER LINE
  - POINT EDWARDS STORM DRAIN LINE
  - 20-MIL POLYETHYLENE SHEETING
  - SITE BOUNDARY
  - DPE DUAL-PHASE EXTRACTION
  - (0.008 UU) CARCINOGENIC POLYNUCLEAR AROMATIC HYDROCARBONS (cPAHs) CONCENTRATION IN MICROGRAMS PER LITER
  - UU THE CONSTITUENTS MAKING UP THE TOTAL ARE ALL NON-DETECTS
  - (NS) NOT SAMPLED

- NOTES:**
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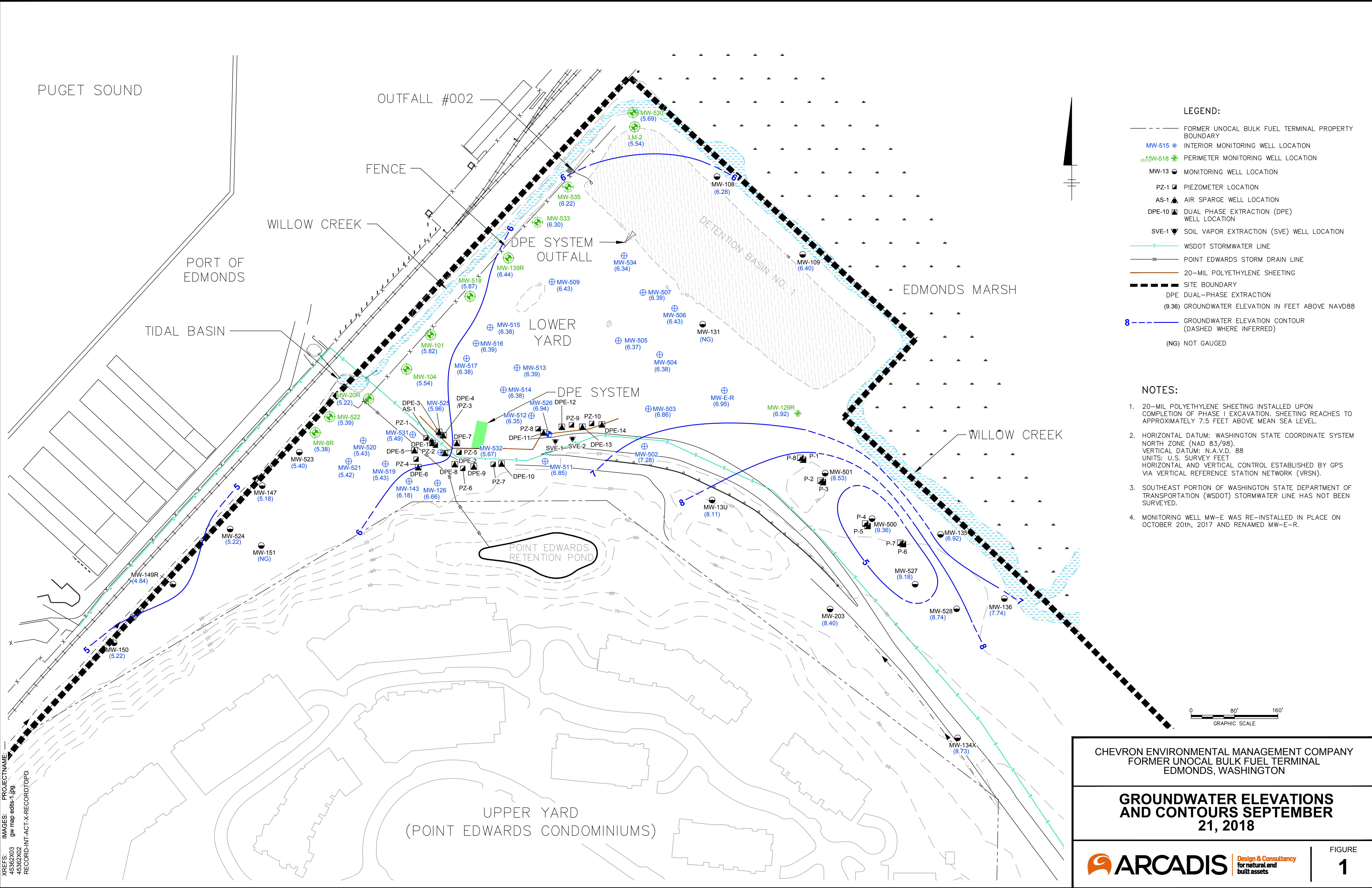
CHEVRON ENVIRONMENTAL MANAGEMENT COMPANY  
 FORMER UNOCAL BULK FUEL TERMINAL  
 EDMONDS, WASHINGTON

**GROUNDWATER cPAHs  
 CONCENTRATION JUNE  
 2018**

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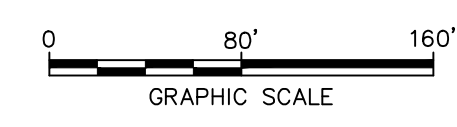
FIGURE  
**4**

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- LEGEND:**
- FORMER UNOCAL BULK FUEL TERMINAL PROPERTY BOUNDARY
  - MW-515 ⊕ INTERIOR MONITORING WELL LOCATION
  - MW-518 ⊕ PERIMETER MONITORING WELL LOCATION
  - MW-13 ⊕ MONITORING WELL LOCATION
  - PZ-1 ⊕ PIEZOMETER LOCATION
  - AS-1 ⊕ AIR SPARGE WELL LOCATION
  - DPE-10 ⊕ DUAL PHASE EXTRACTION (DPE) WELL LOCATION
  - SVE-1 ⊕ SOIL VAPOR EXTRACTION (SVE) WELL LOCATION
  - WSDOT STORMWATER LINE
  - POINT EDWARDS STORM DRAIN LINE
  - 20-MIL POLYETHYLENE SHEETING
  - SITE BOUNDARY
  - DPE DUAL-PHASE EXTRACTION (9.36) GROUNDWATER ELEVATION IN FEET ABOVE NAVD88
  - 8 --- GROUNDWATER ELEVATION CONTOUR (DASHED WHERE INFERRED)
  - (NG) NOT GAUGED

- NOTES:**
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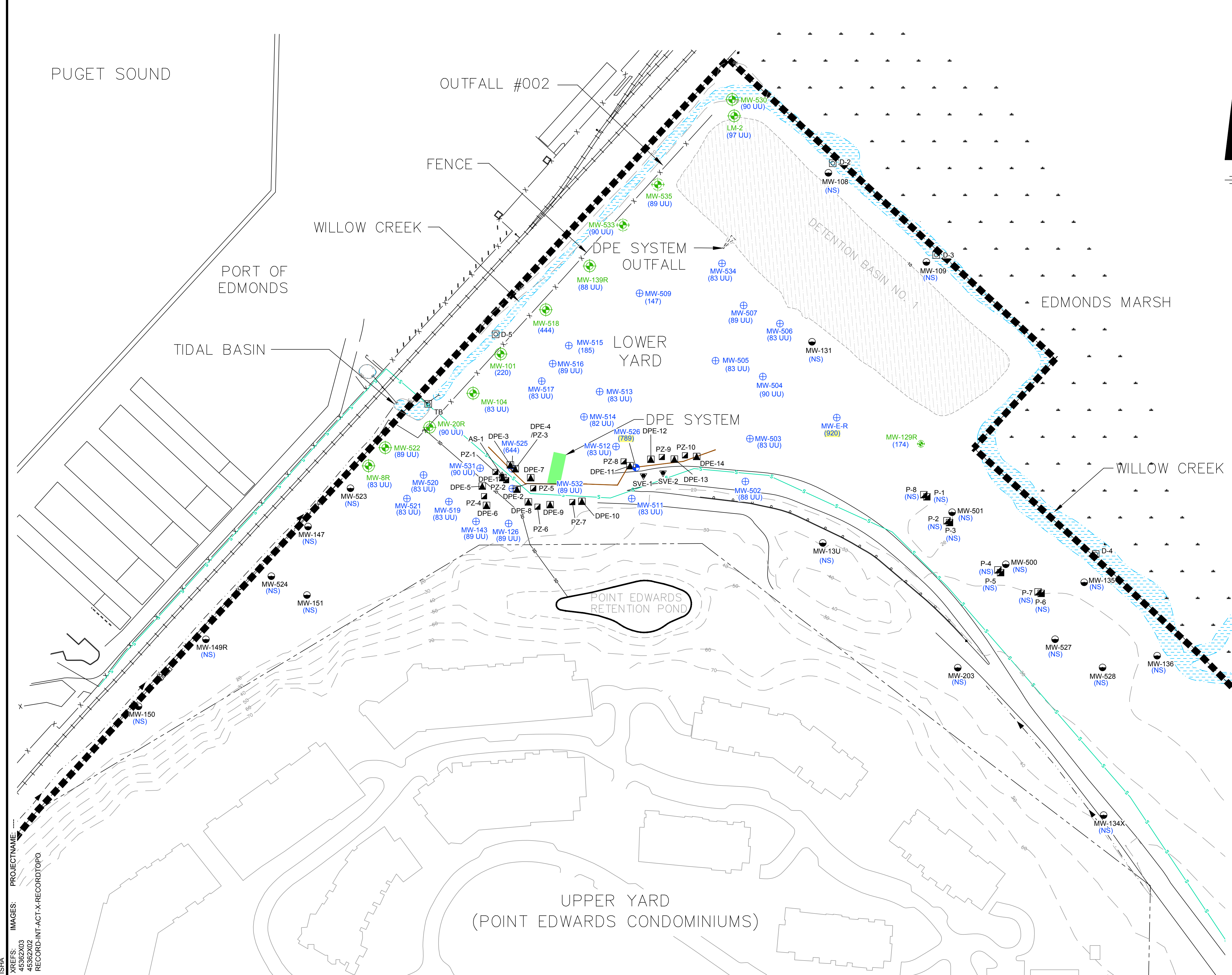
CHEVRON ENVIRONMENTAL MANAGEMENT COMPANY  
 FORMER UNOCAL BULK FUEL TERMINAL  
 EDMONDS, WASHINGTON

**GROUNDWATER ELEVATIONS  
 AND CONTOURS SEPTEMBER  
 21, 2018**

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FIGURE  
**1**

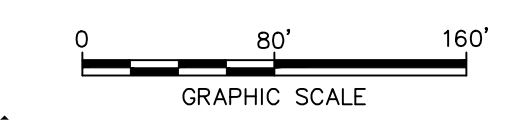
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**LEGEND:**

- FORMER UNOCAL BULK FUEL TERMINAL PROPERTY BOUNDARY
- MW-515 ⊕ INTERIOR MONITORING WELL LOCATION
- MW-518 ⊕ PERIMETER MONITORING WELL LOCATION
- MW-13 ⊙ MONITORING WELL LOCATION
- PZ-1 ⊠ PIEZOMETER LOCATION
- D-2 ⊠ STAFF GAUGE LOCATION
- AS-1 ⊠ AIR SPARGE WELL LOCATION
- DPE-10 ⊠ DUAL PHASE EXTRACTION (DPE) WELL LOCATION
- SVE-1 ⊠ SOIL VAPOR EXTRACTION (SVE) WELL LOCATION
- WSDOT STORMWATER LINE
- POINT EDWARDS STORM DRAIN LINE
- 20-MIL POLYETHYLENE SHEETING
- SITE BOUNDARY
- DPE DUAL-PHASE EXTRACTION
- (920) TOTAL PETROLEUM HYDROCARBON (TPH) CONCENTRATION IN MICROGRAMS PER LITER
- HIGHLIGHTED CONCENTRATIONS EXCEED SAMPLE SPECIFIC TPH CLEANUP LEVEL
- UU THE CONSTITUENTS MAKING UP THE TOTAL ARE ALL NON-DETECTS
- (NS) NOT SAMPLED

- NOTES:**
- 20-MIL POLYETHYLENE SHEETING INSTALLED UPON COMPLETION OF PHASE I EXCAVATION. SHEETING REACHES TO APPROXIMATELY 7.5 FEET ABOVE MEAN SEA LEVEL.
  - HORIZONTAL DATUM: WASHINGTON STATE COORDINATE SYSTEM NORTH ZONE (NAD 83/98). VERTICAL DATUM: N.A.V.D. 88. UNITS: U.S. SURVEY FEET. HORIZONTAL AND VERTICAL CONTROL ESTABLISHED BY GPS VIA VERTICAL REFERENCE STATION NETWORK (VRSN).
  - SOUTHEAST PORTION OF WASHINGTON STATE DEPARTMENT OF TRANSPORTATION (WSDOT) STORMWATER LINE HAS NOT BEEN SURVEYED.
  - MONITORING WELL MW-E WAS RE-INSTALLED IN PLACE ON OCTOBER 20th, 2017 AND RENAMED MW-E-R.



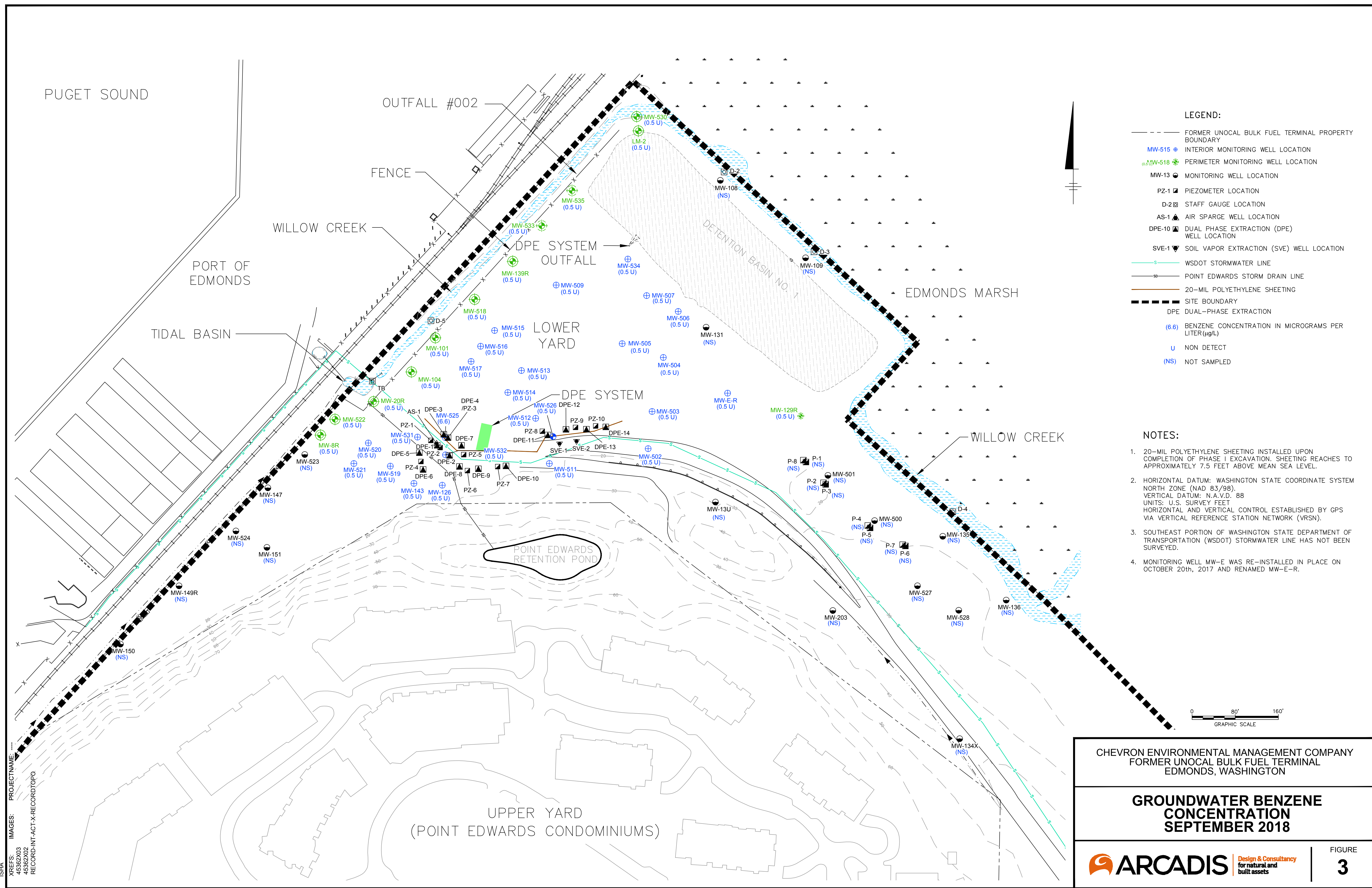
CHEVRON ENVIRONMENTAL MANAGEMENT COMPANY  
FORMER UNOCAL BULK FUEL TERMINAL  
EDMONDS, WASHINGTON

**GROUNDWATER TPH  
CONCENTRATION  
SEPTEMBER 2018**

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FIGURE  
**2**

CITY: MINNEAPOLIS, MN, DIV: GROUP: ENV/CAD, DB: R. OBERLANDER, LD: P. OBERLANDER, PIC: (Opt), FN: (Req'd), TM: (Opt), LTR: (Opt), OFF: (REF),  
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 USA  
 XREFS: PROJECTNAME: RECORD-INT-ACT-X-RECORD/TOPO  
 4592203  
 4592202



- LEGEND:**
- FORMER UNOCAL BULK FUEL TERMINAL PROPERTY BOUNDARY
  - MW-515 ⊕ INTERIOR MONITORING WELL LOCATION
  - MW-518 ⊕ PERIMETER MONITORING WELL LOCATION
  - MW-13 ⊕ MONITORING WELL LOCATION
  - PZ-1 ⊕ PIEZOMETER LOCATION
  - D-2 ⊕ STAFF GAUGE LOCATION
  - AS-1 ⊕ AIR SPARGE WELL LOCATION
  - DPE-10 ⊕ DUAL PHASE EXTRACTION (DPE) WELL LOCATION
  - SVE-1 ⊕ SOIL VAPOR EXTRACTION (SVE) WELL LOCATION
  - WSDOT STORMWATER LINE
  - POINT EDWARDS STORM DRAIN LINE
  - 20-MIL POLYETHYLENE SHEETING
  - SITE BOUNDARY
  - DPE DUAL-PHASE EXTRACTION
  - (6.6) BENZENE CONCENTRATION IN MICROGRAMS PER LITER (µg/L)
  - U NON DETECT
  - (NS) NOT SAMPLED

- NOTES:**
1. 20-MIL POLYETHYLENE SHEETING INSTALLED UPON COMPLETION OF PHASE I EXCAVATION. SHEETING REACHES TO APPROXIMATELY 7.5 FEET ABOVE MEAN SEA LEVEL.
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 VERTICAL DATUM: N.A.V.D. 88  
 UNITS: U.S. SURVEY FEET  
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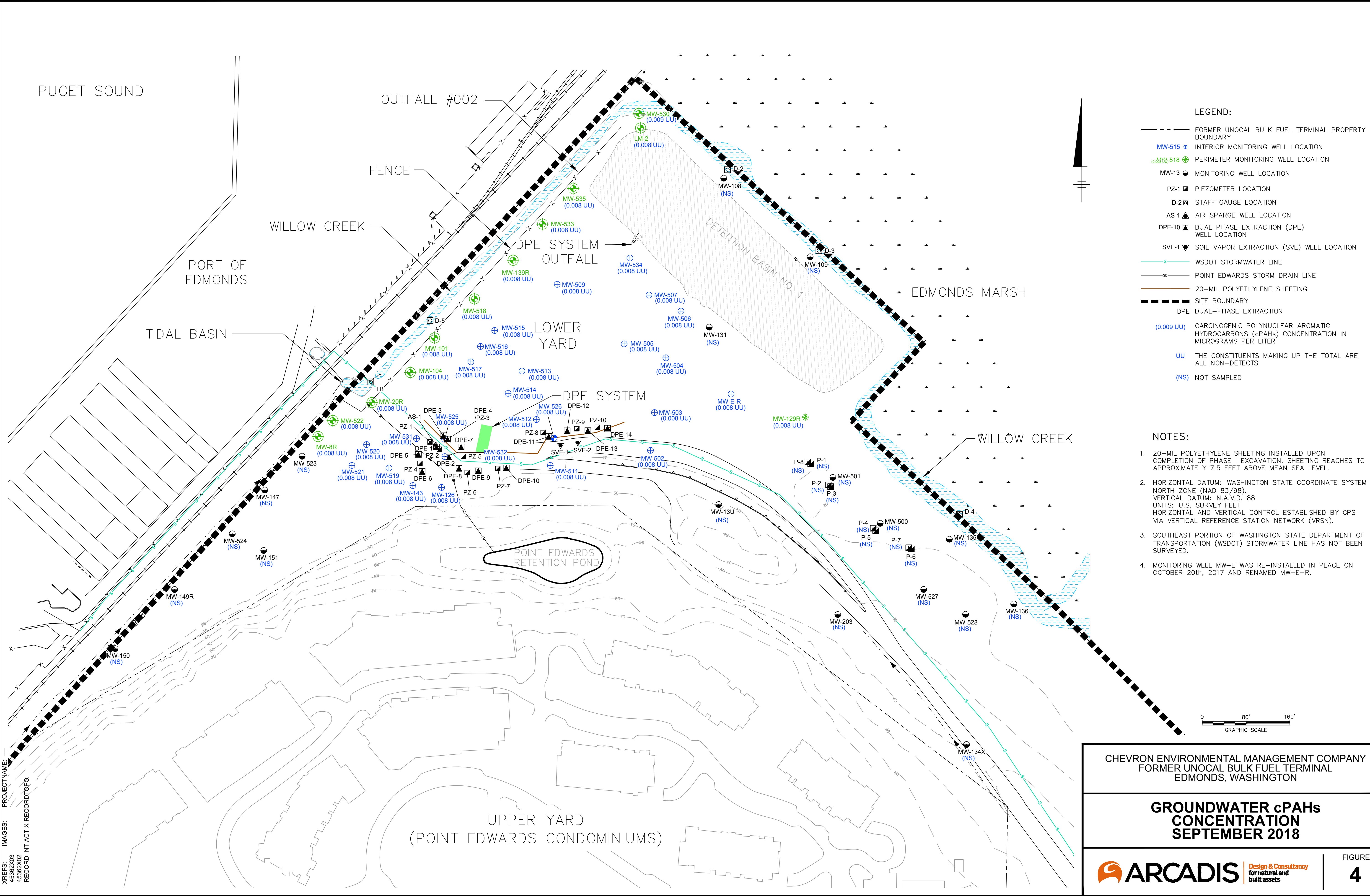
CHEVRON ENVIRONMENTAL MANAGEMENT COMPANY  
 FORMER UNOCAL BULK FUEL TERMINAL  
 EDMONDS, WASHINGTON

**GROUNDWATER BENZENE  
 CONCENTRATION  
 SEPTEMBER 2018**

**ARCADIS** Design & Consultancy  
 for natural and built assets

FIGURE  
**3**

CITY: MINNEAPOLIS, MN, DIV: GROUP: ENV/CAD, DB: R. OBERLANDER, LD: P. OBERLANDER, PIC: (Opt) P.M. (Regd), TM: (Opt) L.Y.R. (Opt) (NS) OFF: REF  
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**LEGEND:**

- FORMER UNOCAL BULK FUEL TERMINAL PROPERTY BOUNDARY
- MW-515 (0.008 UU) INTERIOR MONITORING WELL LOCATION
- MW-518 (0.008 UU) PERIMETER MONITORING WELL LOCATION
- MW-13 MONITORING WELL LOCATION
- PZ-1 PIEZOMETER LOCATION
- D-2 STAFF GAUGE LOCATION
- AS-1 AIR SPARGE WELL LOCATION
- DPE-10 DUAL PHASE EXTRACTION (DPE) WELL LOCATION
- SVE-1 SOIL VAPOR EXTRACTION (SVE) WELL LOCATION
- WSDOT STORMWATER LINE
- POINT EDWARDS STORM DRAIN LINE
- 20-MIL POLYETHYLENE SHEETING
- SITE BOUNDARY
- DPE DUAL-PHASE EXTRACTION
- (0.009 UU) CARCINOGENIC POLYNUCLEAR AROMATIC HYDROCARBONS (cPAHs) CONCENTRATION IN MICROGRAMS PER LITER
- UU THE CONSTITUENTS MAKING UP THE TOTAL ARE ALL NON-DETECTS
- (NS) NOT SAMPLED

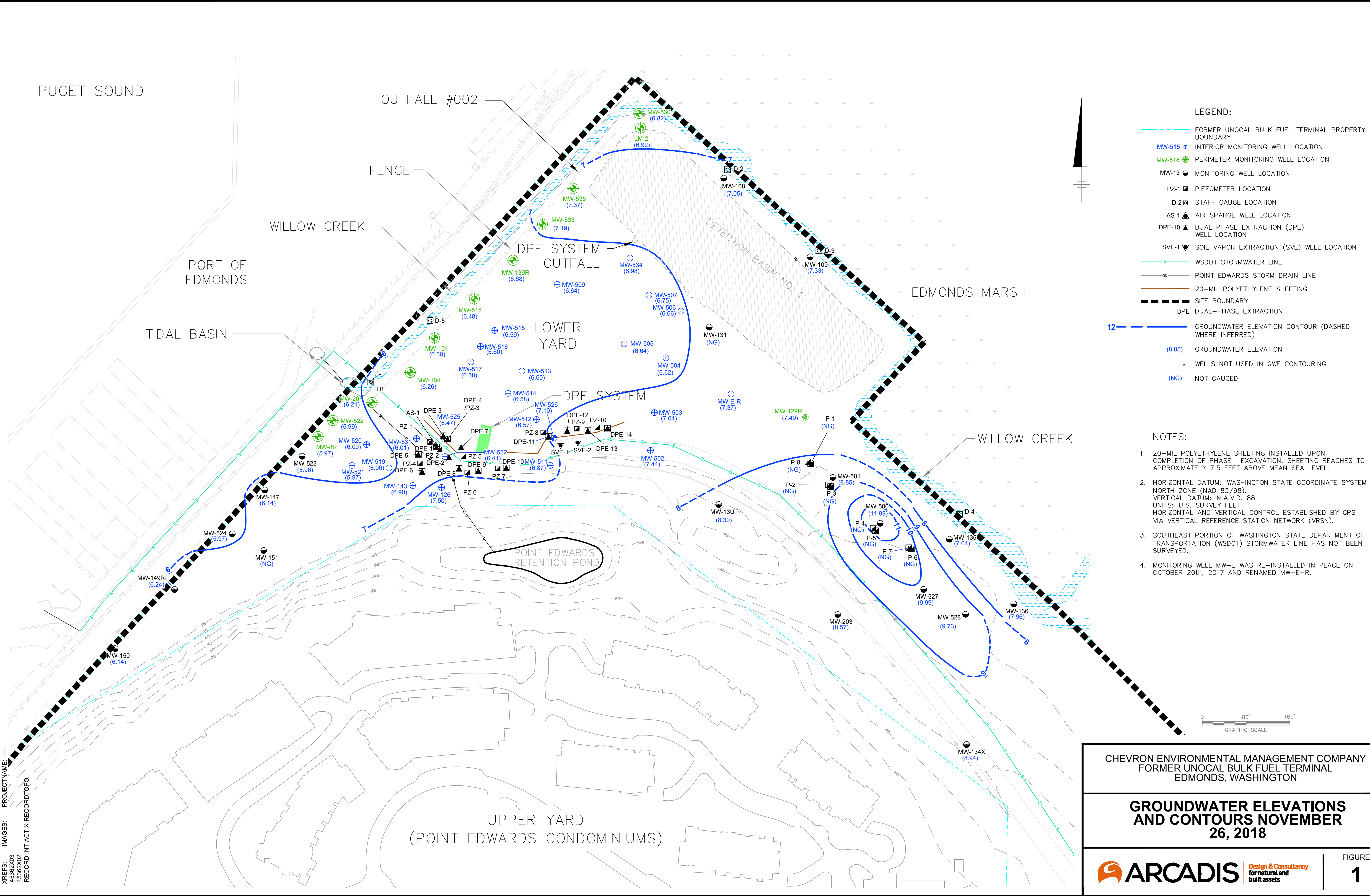
**NOTES:**

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- MONITORING WELL MW-E WAS RE-INSTALLED IN PLACE ON OCTOBER 20th, 2017 AND RENAMED MW-E-R.

0 80' 160'  
GRAPHIC SCALE

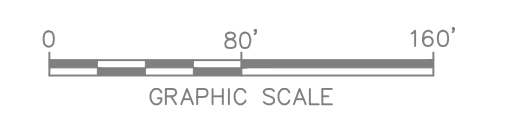
CHEVRON ENVIRONMENTAL MANAGEMENT COMPANY FORMER UNOCAL BULK FUEL TERMINAL EDMONDS, WASHINGTON	
<b>GROUNDWATER cPAHs CONCENTRATION SEPTEMBER 2018</b>	
ARCADIS   Design & Consultancy for natural and built assets	FIGURE <b>4</b>

CITY: MINNEAPOLIS, MN DIV: GROUP: ENV/CAD DB: R. OBERLANDER LD: R. OBERLANDER PIC: (Opt) PK: (Revd) TM: (Opt) Lyr: (Opt) OFF: (REF)  
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 48362X03  
 48362X02



- LEGEND:**
- FORMER UNOCAL BULK FUEL TERMINAL PROPERTY BOUNDARY
  - MW-515 ⊕ INTERIOR MONITORING WELL LOCATION
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  - AS-1 ⊕ AIR SPARGE WELL LOCATION
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  - SVE-1 ⊕ SOIL VAPOR EXTRACTION (SVE) WELL LOCATION
  - WSDOT STORMWATER LINE
  - POINT EDWARDS STORM DRAIN LINE
  - 20-MIL POLYETHYLENE SHEETING
  - SITE BOUNDARY
  - DPE DUAL-PHASE EXTRACTION
  - GROUNDWATER ELEVATION CONTOUR (DASHED WHERE INFERRED)
  - (8.85) GROUNDWATER ELEVATION
  - (NG) WELLS NOT USED IN GWE CONTOURING
  - (NG) NOT GAUGED

- NOTES:**
1. 20-MIL POLYETHYLENE SHEETING INSTALLED UPON COMPLETION OF PHASE I EXCAVATION. SHEETING REACHES TO APPROXIMATELY 7.5 FEET ABOVE MEAN SEA LEVEL.
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CHEVRON ENVIRONMENTAL MANAGEMENT COMPANY  
 FORMER UNOCAL BULK FUEL TERMINAL  
 EDMONDS, WASHINGTON

**GROUNDWATER ELEVATIONS  
 AND CONTOURS NOVEMBER  
 26, 2018**

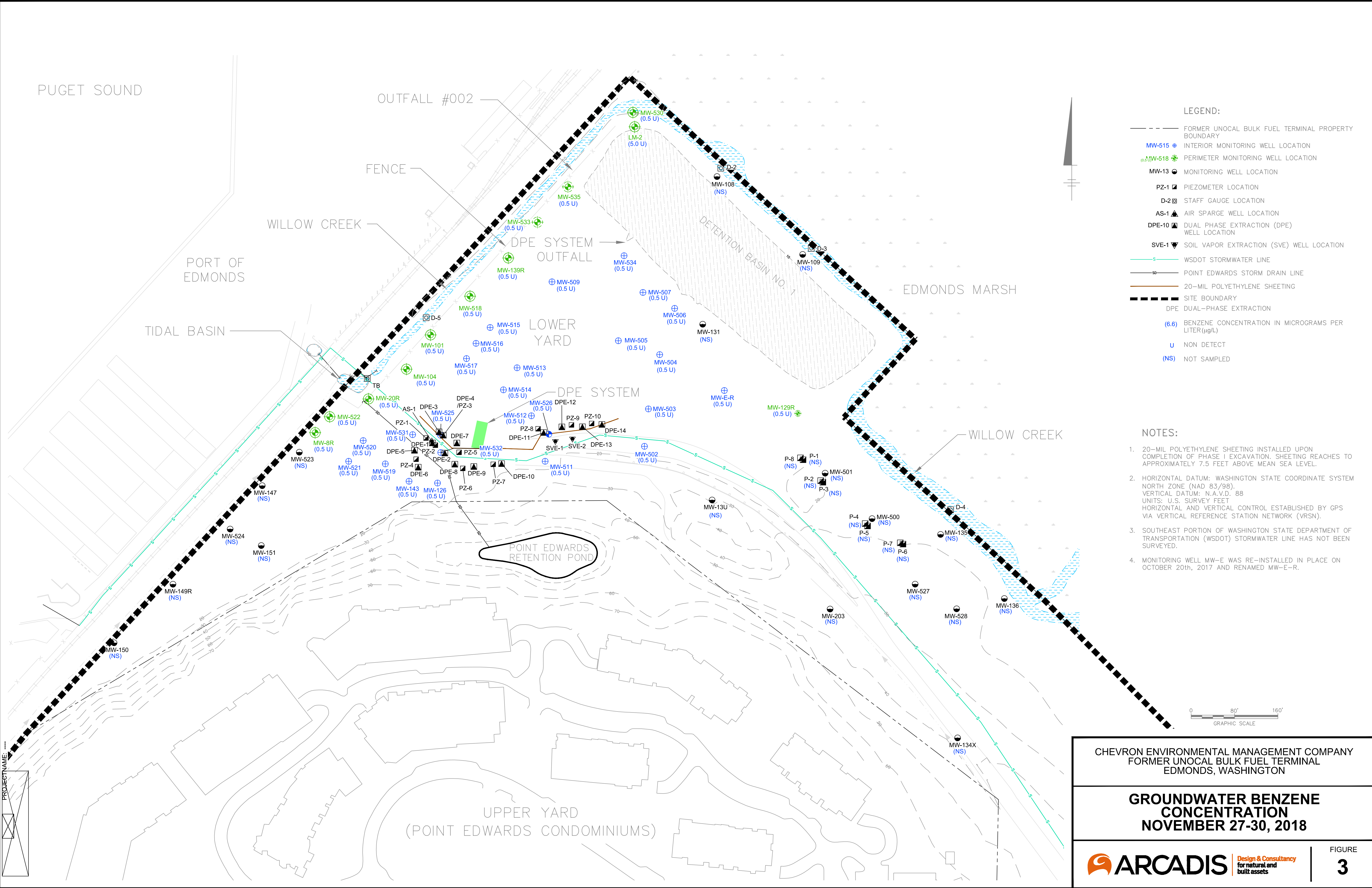
**ARCADIS** Design & Consultancy  
 for natural and built assets

FIGURE  
**1**



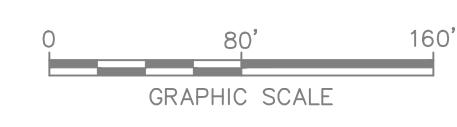


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- LEGEND:**
- FORMER UNOCAL BULK FUEL TERMINAL PROPERTY BOUNDARY
  - MW-515 ⊕ INTERIOR MONITORING WELL LOCATION
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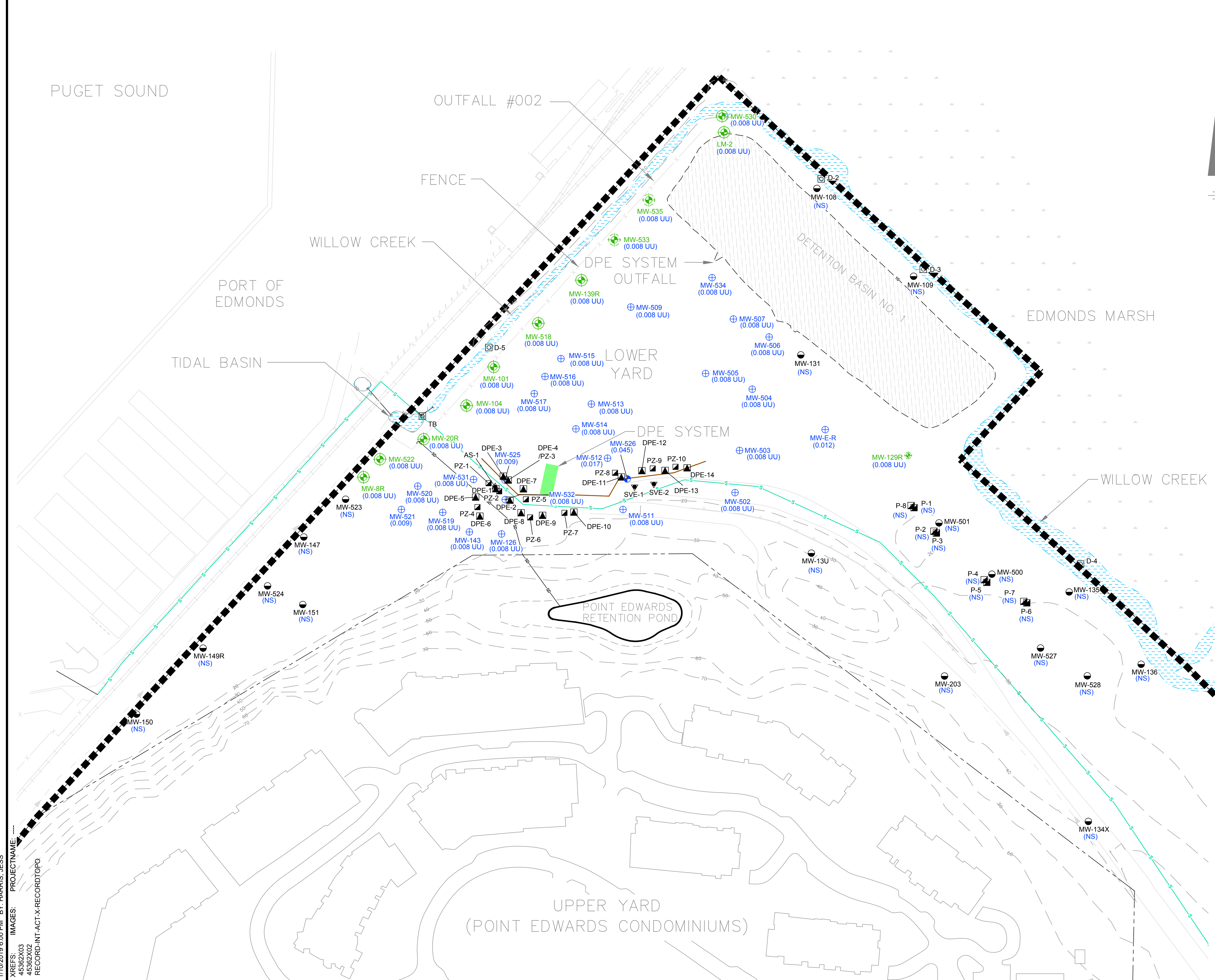
CHEVRON ENVIRONMENTAL MANAGEMENT COMPANY  
 FORMER UNOCAL BULK FUEL TERMINAL  
 EDMONDS, WASHINGTON

**GROUNDWATER BENZENE  
 CONCENTRATION  
 NOVEMBER 27-30, 2018**

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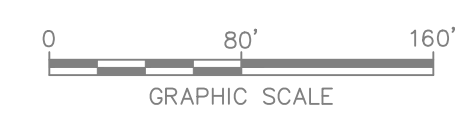
FIGURE  
**3**

CITY: MINNEAPOLIS, MN DIV/GROUP: ENV/CAD DB: R. OBERLANDER, LD: R. OBERLANDER, PIC: (Opt) PM: (Reop) TM: (Opt) LXR: (Opt) OFF: (REF)  
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- LEGEND:**
- FORMER UNOCAL BULK FUEL TERMINAL PROPERTY BOUNDARY
  - MW-515 ⊕ INTERIOR MONITORING WELL LOCATION
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  - SITE BOUNDARY
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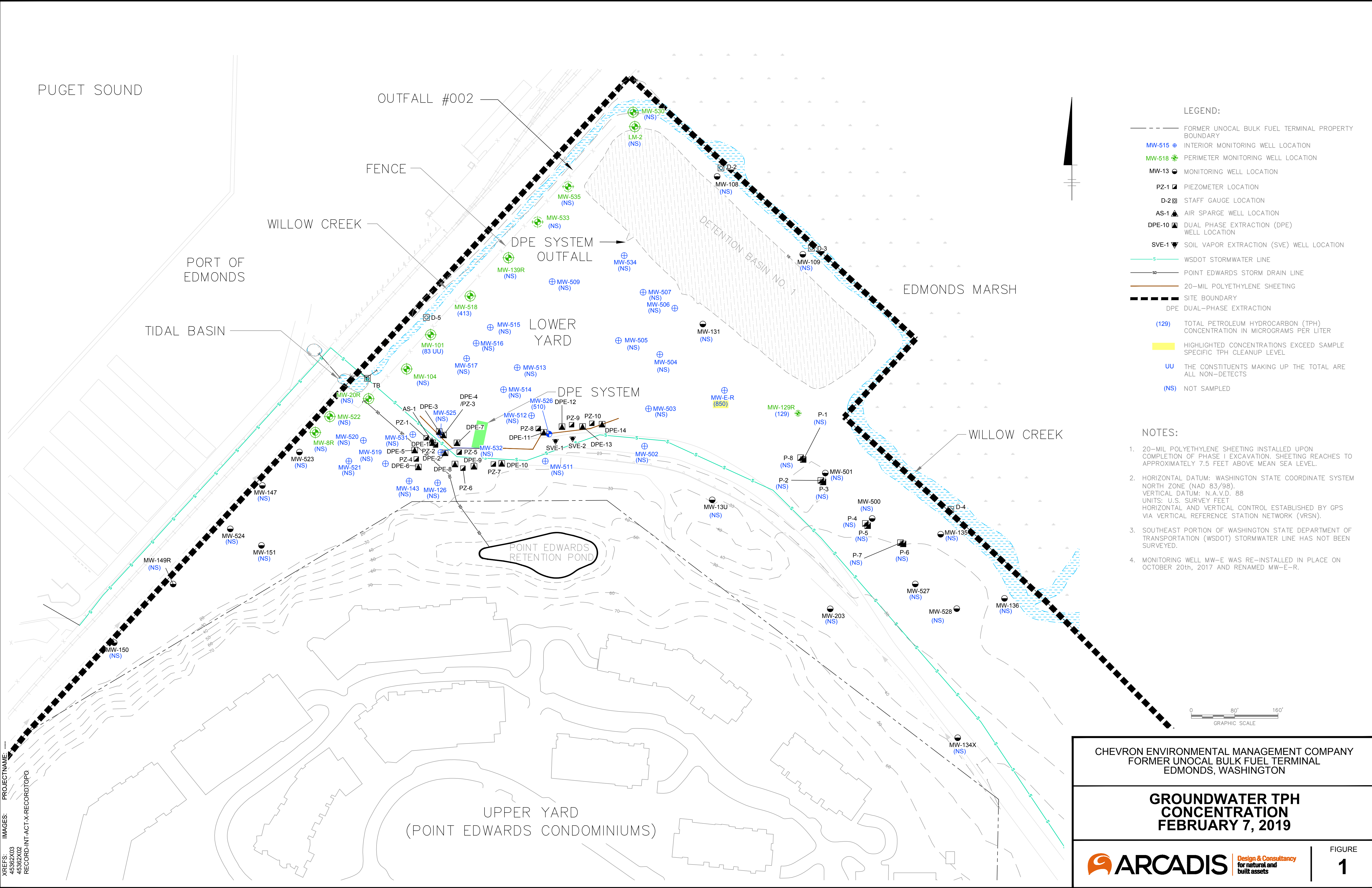
CHEVRON ENVIRONMENTAL MANAGEMENT COMPANY  
 FORMER UNOCAL BULK FUEL TERMINAL  
 EDMONDS, WASHINGTON

**GROUNDWATER cPAHs  
 CONCENTRATION  
 NOVEMBER 27-30, 2018**

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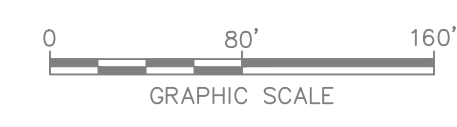
FIGURE  
**4**

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 XREFS: IMAGES: PROJECTNAME: RECORD-INT-ACT-X-RECORD\TOPO  
 45362X03  
 45362X02



- LEGEND:**
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  - AS-1 ⊕ AIR SPARGE WELL LOCATION
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  - SVE-1 ⊕ SOIL VAPOR EXTRACTION (SVE) WELL LOCATION
  - WSDOT STORMWATER LINE
  - POINT EDWARDS STORM DRAIN LINE
  - 20-MIL POLYETHYLENE SHEETING
  - SITE BOUNDARY
  - DPE DUAL-PHASE EXTRACTION
  - (129) TOTAL PETROLEUM HYDROCARBON (TPH) CONCENTRATION IN MICROGRAMS PER LITER
  - Highlighted yellow area: HIGHLIGHTED CONCENTRATIONS EXCEED SAMPLE SPECIFIC TPH CLEANUP LEVEL
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CHEVRON ENVIRONMENTAL MANAGEMENT COMPANY  
 FORMER UNOCAL BULK FUEL TERMINAL  
 EDMONDS, WASHINGTON

**GROUNDWATER TPH  
 CONCENTRATION  
 FEBRUARY 7, 2019**

**ARCADIS** Design & Consultancy  
 for natural and built assets

FIGURE  
**1**

# APPENDIX D

Groundwater Monitoring Laboratory Analytical Reports and Chain of Custody Documentation





## ANALYSIS REPORT

Prepared by:

Eurofins Lancaster Laboratories Environmental  
2425 New Holland Pike  
Lancaster, PA 17601

Prepared for:

Chevron Environmental Mgmt Co  
BR1 X5139C  
6101 Bollinger Canyon Road  
San Ramon CA 94583

Report Date: April 05, 2018 14:54

### Project: Edmonds Terminal

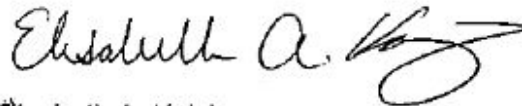
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Group Number: 1921956  
PO Number: 0015268291  
Release Number: JOLITZ  
State of Sample Origin: WA

Regulatory agencies do not accredit laboratories for all methods, analytes, and matrices. Our current scopes of accreditation can be viewed at <http://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster-laboratories-environmental/resources/certifications/>. To request copies of prior scopes of accreditation, contact your project manager.

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Electronic Copy To Arcadis  
Electronic Copy To Arcadis  
Electronic Copy To Arcadis  
Electronic Copy To ARCADIS U.S., Inc.  
Electronic Copy To Arcadis

Attn: Eric Krueger  
Attn: Ryan Brauchla  
Attn: Ophelie Encelle  
Attn: Jason Little  
Attn: Sam Miles  
Attn: Scott Zorn

Respectfully Submitted,



Elisabeth A. Knisley  
Project Manager

(717) 556-7262



## SAMPLE INFORMATION

<u>Client Sample Description</u>	<u>Sample Collection Date/Time</u>	<u>ELLE#</u>
LM-2-W-180320 Grab Groundwater	03/20/2018 14:25	9515647
MW-8R-W-180320 Grab Groundwater	03/20/2018 10:42	9515648
MW-104-W-180320 Grab Groundwater	03/20/2018 10:05	9515649
MW-129R-W-180320 Grab Groundwater	03/20/2018 16:12	9515650
MW-520-W-180320 Grab Groundwater	03/20/2018 09:30	9515651
MW-521-W-180320 Grab Groundwater	03/20/2018 09:50	9515652
MW-522-W-180320 Grab Groundwater	03/20/2018 10:55	9515653
MW-525-W-180320 Grab Groundwater	03/20/2018 12:10	9515654
MW-526-W-180320 Grab Groundwater	03/20/2018 13:40	9515655
MW-530-W-180320 Grab Groundwater	03/20/2018 14:18	9515656
MW-531-W-180320 Grab Groundwater	03/20/2018 12:50	9515657
MW-532-W-180320 Grab Groundwater	03/20/2018 11:15	9515658
MW-532-W-180320 MS Grab Groundwater	03/20/2018 11:15	9515659
MW-532-W-180320 MSD Grab Groundwater	03/20/2018 11:15	9515660
MW-533-W-180320 Grab Groundwater	03/20/2018 11:48	9515661
MW-534-W-180320 Grab Groundwater	03/20/2018 15:55	9515662
MW-535-W-180320 Grab Groundwater	03/20/2018 11:45	9515663
DUP-1-W-180320 Grab Groundwater	03/20/2018	9515664
QA-T-180320 NA Water	03/20/2018	9515665
MW-E-R-W-180320 Grab Groundwater	03/20/2018 14:05	9515666

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

**Sample Description:** LM-2-W-180320 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9515647  
**ELLE Group #:** 1921956  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 03/21/2018 12:40

**Collection Date/Time:** 03/20/2018 14:25

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270C SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14243	Benzo(a)anthracene	56-55-3	0.04	0.01	1
14243	Benzo(a)pyrene	50-32-8	0.07	0.01	1
14243	Benzo(b)fluoranthene	205-99-2	0.2	0.01	1
14243	Benzo(k)fluoranthene	207-08-9	0.06	0.01	1
14243	Chrysene	218-01-9	0.09	0.01	1
14243	Dibenz(a,h)anthracene	53-70-3	0.01	0.01	1
14243	Indeno(1,2,3-cd)pyrene	193-39-5	0.07	0.01	1
<b>GC Volatiles</b>		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	500	10
Reporting limits were raised due to sample foaming.					
<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	2.9	2.0	10
Reporting limits were raised due to sample foaming.					
<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	95	45	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1

### Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14243	SIM SVOAs 8270C MINI	SW-846 8270C SIM	1	18085WAS026	03/28/2018 11:51	Kira N Klaassen	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18085WAS026	03/27/2018 08:30	Logan M Brosemer	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18086A94A	03/27/2018 18:13	Marie D Beamenderfer	10
02102	Method 8021 Water Master	SW-846 8021B	1	18086A94A	03/27/2018 18:13	Marie D Beamenderfer	10
01146	GC VOA Water Prep	SW-846 5030B	1	18086A94A	03/27/2018 18:13	Marie D Beamenderfer	10
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	180820009A	03/29/2018 06:50	Amy Lehr	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	180820009A	03/23/2018 17:00	Oswaldo R Sanchez	1

**Sample Description:** MW-8R-W-180320 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9515648  
**ELLE Group #:** 1921956  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 03/21/2018 12:40  
**Collection Date/Time:** 03/20/2018 10:42

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270C SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14243	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14243	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14243	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14243	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14243	Chrysene	218-01-9	N.D.	0.01	1
14243	Dibenz(a,h)anthracene	53-70-3	N.D.	0.01	1
14243	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	50	1
<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.2	1
<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	48	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	110	1

### Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14243	SIM SVOAs 8270C MINI	SW-846 8270C SIM	1	18085WAS026	03/28/2018 12:19	Kira N Klaassen	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18085WAS026	03/27/2018 08:30	Logan M Brosemer	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18085A94A	03/27/2018 06:45	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18085A94A	03/27/2018 06:45	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18085A94A	03/27/2018 06:45	Jeremy C Giffin	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	180820009A	03/29/2018 07:13	Amy Lehr	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	180820009A	03/23/2018 17:00	Oswaldo R Sanchez	1



**Sample Description:** MW-104-W-180320 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9515649  
**ELLE Group #:** 1921956  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 03/21/2018 12:40  
**Collection Date/Time:** 03/20/2018 10:05

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270C SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14243	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14243	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14243	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14243	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14243	Chrysene	218-01-9	N.D.	0.01	1
14243	Dibenz(a,h)anthracene	53-70-3	N.D.	0.01	1
14243	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	91	50	1
<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.2	1
<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	46	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1

### Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14243	SIM SVOAs 8270C MINI	SW-846 8270C SIM	1	18085WAS026	03/28/2018 12:47	Kira N Klaassen	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18085WAS026	03/27/2018 08:30	Logan M Brosemer	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18085A94A	03/27/2018 07:11	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18085A94A	03/27/2018 07:11	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18085A94A	03/27/2018 07:11	Jeremy C Giffin	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	180820009A	03/29/2018 07:36	Amy Lehr	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	180820009A	03/23/2018 17:00	Oswaldo R Sanchez	1

**Sample Description:** MW-129R-W-180320 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
ELLE Sample #: WW 9515650  
ELLE Group #: 1921956  
Matrix: Groundwater

**Project Name:** Edmonds Terminal

Submittal Date/Time: 03/21/2018 12:40

Collection Date/Time: 03/20/2018 16:12

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270C SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14243	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14243	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14243	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14243	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14243	Chrysene	218-01-9	N.D.	0.01	1
14243	Dibenz(a,h)anthracene	53-70-3	N.D.	0.01	1
14243	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	50	1
<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.2	1
<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	1,900	50	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	110	1

### Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14243	SIM SVOAs 8270C MINI	SW-846 8270C SIM	1	18085WAS026	03/28/2018 13:15	Kira N Klaassen	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18085WAS026	03/27/2018 08:30	Logan M Brosemer	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18085A94A	03/27/2018 07:37	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18085A94A	03/27/2018 07:37	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18085A94A	03/27/2018 07:37	Jeremy C Giffin	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	180890022A	04/04/2018 03:01	Thomas C Wildermuth	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	2	180890022A	03/30/2018 18:09	Kate E Lutte	1

**Sample Description:** MW-520-W-180320 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9515651  
**ELLE Group #:** 1921956  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 03/21/2018 12:40  
**Collection Date/Time:** 03/20/2018 09:30

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270C SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14243	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14243	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14243	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14243	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14243	Chrysene	218-01-9	N.D.	0.01	1
14243	Dibenz(a,h)anthracene	53-70-3	N.D.	0.01	1
14243	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	50	1
<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.2	1
<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	47	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	110	1

### Sample Comments

State of Washington Lab Certification No. C457

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### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14243	SIM SVOAs 8270C MINI	SW-846 8270C SIM	1	18085WAS026	03/28/2018 13:42	Kira N Klaassen	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18085WAS026	03/27/2018 08:30	Logan M Brosemer	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18085A94A	03/27/2018 08:03	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18085A94A	03/27/2018 08:03	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18085A94A	03/27/2018 08:03	Jeremy C Giffin	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	180820009A	03/29/2018 08:21	Amy Lehr	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	180820009A	03/23/2018 17:00	Oswaldo R Sanchez	1

**Sample Description:** MW-521-W-180320 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
ELLE Sample #: WW 9515652  
ELLE Group #: 1921956  
Matrix: Groundwater

**Project Name:** Edmonds Terminal

Submission Date/Time: 03/21/2018 12:40  
Collection Date/Time: 03/20/2018 09:50

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270C SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14243	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14243	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14243	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14243	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14243	Chrysene	218-01-9	N.D.	0.01	1
14243	Dibenz(a,h)anthracene	53-70-3	N.D.	0.01	1
14243	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	50	1
<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.2	1
<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	46	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1

### Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14243	SIM SVOAs 8270C MINI	SW-846 8270C SIM	1	18085WAS026	03/28/2018 14:11	Kira N Klaassen	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18085WAS026	03/27/2018 08:30	Logan M Brosemer	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18085A94A	03/27/2018 09:19	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18085A94A	03/27/2018 09:19	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18085A94A	03/27/2018 09:19	Jeremy C Giffin	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	180820009A	03/29/2018 08:44	Amy Lehr	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	180820009A	03/23/2018 17:00	Oswaldo R Sanchez	1

**Sample Description:** MW-522-W-180320 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
ELLE Sample #: WW 9515653  
ELLE Group #: 1921956  
Matrix: Groundwater

**Project Name:** Edmonds Terminal

Submittal Date/Time: 03/21/2018 12:40  
Collection Date/Time: 03/20/2018 10:55

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270C SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14243	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14243	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14243	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14243	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14243	Chrysene	218-01-9	N.D.	0.01	1
14243	Dibenz(a,h)anthracene	53-70-3	N.D.	0.01	1
14243	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	50	1
<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.2	1
<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	46	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1

### Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14243	SIM SVOAs 8270C MINI	SW-846 8270C SIM	1	18085WAS026	03/28/2018 14:39	Kira N Klaassen	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18085WAS026	03/27/2018 08:30	Logan M Brosemer	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18085A94A	03/27/2018 09:45	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18085A94A	03/27/2018 09:45	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18085A94A	03/27/2018 09:45	Jeremy C Giffin	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	180820009A	03/29/2018 09:06	Amy Lehr	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	180820009A	03/23/2018 17:00	Oswaldo R Sanchez	1

**Sample Description:** MW-525-W-180320 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
ELLE Sample #: WW 9515654  
ELLE Group #: 1921956  
Matrix: Groundwater

**Project Name:** Edmonds Terminal

Submission Date/Time: 03/21/2018 12:40  
Collection Date/Time: 03/20/2018 12:10

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270C SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14243	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14243	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14243	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14243	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14243	Chrysene	218-01-9	N.D.	0.01	1
14243	Dibenz(a,h)anthracene	53-70-3	N.D.	0.01	1
14243	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	920	50	1
<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	14	0.2	1
<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	49	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	110	1

### Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14243	SIM SVOAs 8270C MINI	SW-846 8270C SIM	1	18085WAS026	03/28/2018 15:07	Kira N Klaassen	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18085WAS026	03/27/2018 08:30	Logan M Brosemer	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18085A94A	03/27/2018 10:10	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18085A94A	03/27/2018 10:10	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18085A94A	03/27/2018 10:10	Jeremy C Giffin	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	180820009A	03/29/2018 09:29	Amy Lehr	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	180820009A	03/23/2018 17:00	Oswaldo R Sanchez	1

**Sample Description:** MW-526-W-180320 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
ELLE Sample #: WW 9515655  
ELLE Group #: 1921956  
Matrix: Groundwater

**Project Name:** Edmonds Terminal

Submission Date/Time: 03/21/2018 12:40  
Collection Date/Time: 03/20/2018 13:40

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270C SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14243	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14243	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14243	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14243	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14243	Chrysene	218-01-9	N.D.	0.01	1
14243	Dibenz(a,h)anthracene	53-70-3	N.D.	0.01	1
14243	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	1,800	50	1
<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	1	0.2	1
<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	210	46	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1

### Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14243	SIM SVOAs 8270C MINI	SW-846 8270C SIM	1	18085WAS026	03/28/2018 15:35	Kira N Klaassen	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18085WAS026	03/27/2018 08:30	Logan M Brosemer	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18086A94A	03/28/2018 03:37	Marie D Beamenderfer	1
02102	Method 8021 Water Master	SW-846 8021B	1	18086A94A	03/28/2018 03:37	Marie D Beamenderfer	1
01146	GC VOA Water Prep	SW-846 5030B	1	18086A94A	03/28/2018 03:37	Marie D Beamenderfer	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	180820009A	03/29/2018 09:52	Amy Lehr	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	180820009A	03/23/2018 17:00	Oswaldo R Sanchez	1

**Sample Description:** MW-530-W-180320 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9515656  
**ELLE Group #:** 1921956  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 03/21/2018 12:40  
**Collection Date/Time:** 03/20/2018 14:18

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270C SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14243	Benzo(a)anthracene	56-55-3	0.02	0.01	1
14243	Benzo(a)pyrene	50-32-8	0.02	0.01	1
14243	Benzo(b)fluoranthene	205-99-2	0.02	0.01	1
14243	Benzo(k)fluoranthene	207-08-9	0.02	0.01	1
14243	Chrysene	218-01-9	0.02	0.01	1
14243	Dibenz(a,h)anthracene	53-70-3	0.02	0.01	1
14243	Indeno(1,2,3-cd)pyrene	193-39-5	0.02	0.01	1
<b>GC Volatiles</b>		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	50	1
<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.2	1
<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	45	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1

### Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14243	SIM SVOAs 8270C MINI	SW-846 8270C SIM	1	18085WAS026	03/28/2018 16:03	Kira N Klaassen	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18085WAS026	03/27/2018 08:30	Logan M Brosemer	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18086A94A	03/27/2018 18:39	Marie D Beamenderfer	1
02102	Method 8021 Water Master	SW-846 8021B	1	18086A94A	03/27/2018 18:39	Marie D Beamenderfer	1
01146	GC VOA Water Prep	SW-846 5030B	1	18086A94A	03/27/2018 18:39	Marie D Beamenderfer	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	180860031A	03/31/2018 00:22	Amy Lehr	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	180860031A	03/28/2018 12:30	Logan M Brosemer	1



**Sample Description:** MW-531-W-180320 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9515657  
**ELLE Group #:** 1921956  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 03/21/2018 12:40  
**Collection Date/Time:** 03/20/2018 12:50

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270C SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14243	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14243	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14243	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14243	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14243	Chrysene	218-01-9	N.D.	0.01	1
14243	Dibenz(a,h)anthracene	53-70-3	N.D.	0.01	1
14243	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	50	1
<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.2	1
<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	45	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1

### Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14243	SIM SVOAs 8270C MINI	SW-846 8270C SIM	1	18085WAS026	03/28/2018 16:31	Kira N Klaassen	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18085WAS026	03/27/2018 08:30	Logan M Brosemer	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18086A94A	03/27/2018 19:05	Marie D Beamenderfer	1
02102	Method 8021 Water Master	SW-846 8021B	1	18086A94A	03/27/2018 19:05	Marie D Beamenderfer	1
01146	GC VOA Water Prep	SW-846 5030B	1	18086A94A	03/27/2018 19:05	Marie D Beamenderfer	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	180860031A	03/31/2018 00:46	Amy Lehr	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	180860031A	03/28/2018 12:30	Logan M Brosemer	1

**Sample Description:** MW-532-W-180320 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9515658  
**ELLE Group #:** 1921956  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 03/21/2018 12:40

**Collection Date/Time:** 03/20/2018 11:15

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270C SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14243	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14243	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14243	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14243	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14243	Chrysene	218-01-9	N.D.	0.01	1
14243	Dibenz(a,h)anthracene	53-70-3	N.D.	0.01	1
14243	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	50	1
<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.2	1
<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	46	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1

### Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14243	SIM SVOAs 8270C MINI	SW-846 8270C SIM	1	18085WAS026	03/28/2018 10:27	Kira N Klaassen	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18085WAS026	03/27/2018 08:30	Logan M Brosemer	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18086A94A	03/27/2018 20:47	Marie D Beamenderfer	1
02102	Method 8021 Water Master	SW-846 8021B	1	18086A94A	03/27/2018 20:47	Marie D Beamenderfer	1
01146	GC VOA Water Prep	SW-846 5030B	1	18086A94A	03/27/2018 20:47	Marie D Beamenderfer	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	180860031A	03/31/2018 01:09	Amy Lehr	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	180860031A	03/28/2018 12:30	Logan M Brosemer	1

**Sample Description:** MW-532-W-180320 MS Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9515659  
**ELLE Group #:** 1921956  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 03/21/2018 12:40  
**Collection Date/Time:** 03/20/2018 11:15

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270C SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14243	Benzo(a)anthracene	56-55-3	0.9	0.01	1
14243	Benzo(a)pyrene	50-32-8	0.8	0.01	1
14243	Benzo(b)fluoranthene	205-99-2	0.9	0.01	1
14243	Benzo(k)fluoranthene	207-08-9	0.9	0.01	1
14243	Chrysene	218-01-9	0.9	0.01	1
14243	Dibenz(a,h)anthracene	53-70-3	0.9	0.01	1
14243	Indeno(1,2,3-cd)pyrene	193-39-5	0.9	0.01	1
<b>GC Volatiles</b>		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	1,600	50	1
<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	21	0.2	1
<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	220	46	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1

### Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14243	SIM SVOAs 8270C MINI	SW-846 8270C SIM	1	18085WAS026	03/28/2018 10:55	Kira N Klaassen	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18085WAS026	03/27/2018 08:30	Logan M Brosemer	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18086A94A	03/27/2018 22:04	Marie D Beamenderfer	1
02102	Method 8021 Water Master	SW-846 8021B	1	18086A94A	03/27/2018 21:13	Marie D Beamenderfer	1
01146	GC VOA Water Prep	SW-846 5030B	1	18086A94A	03/27/2018 21:13	Marie D Beamenderfer	1
01146	GC VOA Water Prep	SW-846 5030B	2	18086A94A	03/27/2018 22:04	Marie D Beamenderfer	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	180860031A	03/31/2018 01:33	Amy Lehr	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	180860031A	03/28/2018 12:30	Logan M Brosemer	1

**Sample Description:** MW-532-W-180320 MSD Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9515660  
**ELLE Group #:** 1921956  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 03/21/2018 12:40  
**Collection Date/Time:** 03/20/2018 11:15

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270C SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14243	Benzo(a)anthracene	56-55-3	0.9	0.01	1
14243	Benzo(a)pyrene	50-32-8	0.8	0.01	1
14243	Benzo(b)fluoranthene	205-99-2	0.9	0.01	1
14243	Benzo(k)fluoranthene	207-08-9	0.9	0.01	1
14243	Chrysene	218-01-9	0.9	0.01	1
14243	Dibenz(a,h)anthracene	53-70-3	0.8	0.01	1
14243	Indeno(1,2,3-cd)pyrene	193-39-5	0.8	0.01	1
<b>GC Volatiles</b>		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	1,500	50	1
<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	21	0.2	1
<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	190	45	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1

### Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14243	SIM SVOAs 8270C MINI	SW-846 8270C SIM	1	18085WAS026	03/28/2018 11:23	Kira N Klaassen	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18085WAS026	03/27/2018 08:30	Logan M Brosemer	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18086A94A	03/27/2018 22:30	Marie D Beamenderfer	1
02102	Method 8021 Water Master	SW-846 8021B	1	18086A94A	03/27/2018 21:39	Marie D Beamenderfer	1
01146	GC VOA Water Prep	SW-846 5030B	1	18086A94A	03/27/2018 21:39	Marie D Beamenderfer	1
01146	GC VOA Water Prep	SW-846 5030B	2	18086A94A	03/27/2018 22:30	Marie D Beamenderfer	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	180860031A	03/31/2018 01:56	Amy Lehr	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	180860031A	03/28/2018 12:30	Logan M Brosemer	1

**Sample Description:** MW-533-W-180320 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9515661  
**ELLE Group #:** 1921956  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 03/21/2018 12:40  
**Collection Date/Time:** 03/20/2018 11:48

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270C SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14243	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14243	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14243	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14243	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14243	Chrysene	218-01-9	N.D.	0.01	1
14243	Dibenz(a,h)anthracene	53-70-3	N.D.	0.01	1
14243	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	50	1
<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.2	1
<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	47	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1

### Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14243	SIM SVOAs 8270C MINI	SW-846 8270C SIM	1	18085WAS026	03/28/2018 16:59	Kira N Klaassen	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18085WAS026	03/27/2018 08:30	Logan M Brosemer	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18086A94A	03/27/2018 19:30	Marie D Beamenderfer	1
02102	Method 8021 Water Master	SW-846 8021B	1	18086A94A	03/27/2018 19:30	Marie D Beamenderfer	1
01146	GC VOA Water Prep	SW-846 5030B	1	18086A94A	03/27/2018 19:30	Marie D Beamenderfer	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	180860031A	03/31/2018 02:20	Amy Lehr	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	180860031A	03/28/2018 12:30	Logan M Brosemer	1

**Sample Description:** MW-534-W-180320 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9515662  
**ELLE Group #:** 1921956  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 03/21/2018 12:40  
**Collection Date/Time:** 03/20/2018 15:55

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270C SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14243	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14243	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14243	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14243	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14243	Chrysene	218-01-9	N.D.	0.01	1
14243	Dibenz(a,h)anthracene	53-70-3	N.D.	0.01	1
14243	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	50	1
<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.2	1
<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	45	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1

### Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14243	SIM SVOAs 8270C MINI	SW-846 8270C SIM	1	18085WAS026	03/28/2018 17:27	Kira N Klaassen	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18085WAS026	03/27/2018 08:30	Logan M Brosemer	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18086A94A	03/27/2018 19:56	Marie D Beamenderfer	1
02102	Method 8021 Water Master	SW-846 8021B	1	18086A94A	03/27/2018 19:56	Marie D Beamenderfer	1
01146	GC VOA Water Prep	SW-846 5030B	1	18086A94A	03/27/2018 19:56	Marie D Beamenderfer	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	180860031A	03/31/2018 02:43	Amy Lehr	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	180860031A	03/28/2018 12:30	Logan M Brosemer	1

**Sample Description:** MW-535-W-180320 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
ELLE Sample #: WW 9515663  
ELLE Group #: 1921956  
Matrix: Groundwater

**Project Name:** Edmonds Terminal

Submission Date/Time: 03/21/2018 12:40

Collection Date/Time: 03/20/2018 11:45

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270C SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14243	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14243	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14243	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14243	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14243	Chrysene	218-01-9	N.D.	0.01	1
14243	Dibenz(a,h)anthracene	53-70-3	N.D.	0.01	1
14243	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	50	1
<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.2	1
<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	45	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1

### Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14243	SIM SVOAs 8270C MINI	SW-846 8270C SIM	1	18085WAS026	03/28/2018 17:55	Kira N Klaassen	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18085WAS026	03/27/2018 08:30	Logan M Brosemer	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18086A94A	03/27/2018 20:22	Marie D Beamenderfer	1
02102	Method 8021 Water Master	SW-846 8021B	1	18086A94A	03/27/2018 20:22	Marie D Beamenderfer	1
01146	GC VOA Water Prep	SW-846 5030B	1	18086A94A	03/27/2018 20:22	Marie D Beamenderfer	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	180860031A	03/31/2018 03:07	Amy Lehr	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	180860031A	03/28/2018 12:30	Logan M Brosemer	1

**Sample Description:** DUP-1-W-180320 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9515664  
**ELLE Group #:** 1921956  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 03/21/2018 12:40  
**Collection Date/Time:** 03/20/2018

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270C SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14243	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14243	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14243	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14243	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14243	Chrysene	218-01-9	N.D.	0.01	1
14243	Dibenz(a,h)anthracene	53-70-3	N.D.	0.01	1
14243	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	50	1
<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.2	1
<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	46	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1

### Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14243	SIM SVOAs 8270C MINI	SW-846 8270C SIM	1	18085WAS026	03/28/2018 18:24	Kira N Klaassen	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18085WAS026	03/27/2018 08:30	Logan M Brosemer	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18086A94A	03/27/2018 23:47	Marie D Beamenderfer	1
02102	Method 8021 Water Master	SW-846 8021B	1	18086A94A	03/27/2018 23:47	Marie D Beamenderfer	1
01146	GC VOA Water Prep	SW-846 5030B	1	18086A94A	03/27/2018 23:47	Marie D Beamenderfer	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	180860031A	03/31/2018 03:30	Amy Lehr	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	180860031A	03/28/2018 12:30	Logan M Brosemer	1



**Sample Description:** QA-T-180320 NA Water  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9515665  
**ELLE Group #:** 1921956  
**Matrix:** Water

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 03/21/2018 12:40  
**Collection Date/Time:** 03/20/2018

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC Volatiles</b>					
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx n.a.	ug/l N.D.	ug/l 50	1
<b>GC Volatiles</b>					
02102	Benzene	SW-846 8021B 71-43-2	ug/l N.D.	ug/l 0.2	1

### Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18086A94A	03/27/2018 17:47	Marie D Beamenderfer	1
02102	Method 8021 Water Master	SW-846 8021B	1	18086A94A	03/27/2018 17:47	Marie D Beamenderfer	1
01146	GC VOA Water Prep	SW-846 5030B	1	18086A94A	03/27/2018 17:47	Marie D Beamenderfer	1

**Sample Description:** MW-E-R-W-180320 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9515666  
**ELLE Group #:** 1921956  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 03/21/2018 12:40

**Collection Date/Time:** 03/20/2018 14:05

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270C SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14243	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14243	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14243	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14243	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14243	Chrysene	218-01-9	N.D.	0.01	1
14243	Dibenz(a,h)anthracene	53-70-3	N.D.	0.01	1
14243	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	410	50	1
<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.2	1
<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	46	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1

### Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14243	SIM SVOAs 8270C MINI	SW-846 8270C SIM	1	18085WAS026	03/29/2018 01:34	Brandon K Cordova	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18085WAS026	03/27/2018 08:30	Logan M Brosemer	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18086A94A	03/28/2018 00:12	Marie D Beamenderfer	1
02102	Method 8021 Water Master	SW-846 8021B	1	18086A94A	03/28/2018 00:12	Marie D Beamenderfer	1
01146	GC VOA Water Prep	SW-846 5030B	1	18086A94A	03/28/2018 00:12	Marie D Beamenderfer	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	180860031A	03/31/2018 03:54	Amy Lehr	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	180860031A	03/28/2018 12:30	Logan M Brosemer	1

## Quality Control Summary

Client Name: Chevron Environmental Mgmt Co  
Reported: 04/05/2018 14:54

Group Number: 1921956

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

### Method Blank

Analysis Name	Result ug/l	MDL ug/l
Batch number: 18085WAS026	Sample number(s): 9515647-9515664,9515666	
Benzo(a)anthracene	N.D.	0.01
Benzo(a)pyrene	N.D.	0.01
Benzo(b)fluoranthene	N.D.	0.01
Benzo(k)fluoranthene	N.D.	0.01
Chrysene	N.D.	0.01
Dibenz(a,h)anthracene	N.D.	0.01
Indeno(1,2,3-cd)pyrene	N.D.	0.01
Batch number: 18085A94A	Sample number(s): 9515648-9515654	
Benzene	N.D.	0.2
NWTPH-Gx water C7-C12	N.D.	50
Batch number: 18086A94A	Sample number(s): 9515647,9515655-9515666	
Benzene	N.D.	0.2
NWTPH-Gx water C7-C12	N.D.	50
Batch number: 180820009A	Sample number(s): 9515647-9515649,9515651-9515655	
DX DRO C12-C24 w/ SiGel	N.D.	45
DX HRO C24-C40 w/ SiGel	N.D.	100
Batch number: 180860031A	Sample number(s): 9515656-9515664,9515666	
DX DRO C12-C24 w/ SiGel	N.D.	45
DX HRO C24-C40 w/ SiGel	N.D.	100
Batch number: 180890022A	Sample number(s): 9515650	
DX DRO C12-C24 w/ SiGel	N.D.	45
DX HRO C24-C40 w/ SiGel	N.D.	100

### LCS/LCSD

Analysis Name	LCS Spike Added ug/l	LCS Conc ug/l	LCSD Spike Added ug/l	LCSD Conc ug/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: 18085WAS026	Sample number(s): 9515647-9515664,9515666								
Benzo(a)anthracene	1.00	0.914			91		65-129		
Benzo(a)pyrene	1.00	0.983			98		65-126		
Benzo(b)fluoranthene	1.00	0.992			99		65-136		
Benzo(k)fluoranthene	1.00	0.948			95		65-131		

\*- Outside of specification

(1) The result for one or both determinations was less than five times the LOQ.

(2) The unspiked result was more than four times the spike added.

P##### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

## Quality Control Summary

Client Name: Chevron Environmental Mgmt Co  
Reported: 04/05/2018 14:54

Group Number: 1921956

### LCS/LCSD (continued)

Analysis Name	LCS Spike Added ug/l	LCS Conc ug/l	LCSD Spike Added ug/l	LCSD Conc ug/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Chrysene	1.00	0.904			90		62-129		
Dibenz(a,h)anthracene	1.00	0.938			94		50-139		
Indeno(1,2,3-cd)pyrene	1.00	0.912			91		52-133		
	ug/l	ug/l	ug/l	ug/l					
Batch number: 18085A94A	Sample number(s): 9515648-9515654								
Benzene	20	19.51	20	19.93	98	100	80-120	2	30
NWTPH-Gx water C7-C12	1100	1285.48	1100	1310.15	117	119	80-120	2	30
Batch number: 18086A94A	Sample number(s): 9515647,9515655-9515666								
Benzene	20	18.77			94		80-120		
NWTPH-Gx water C7-C12	1100	1298.25			118		80-120		
	ug/l	ug/l	ug/l	ug/l					
Batch number: 180820009A	Sample number(s): 9515647-9515649,9515651-9515655								
DX DRO C12-C24 w/ SiGel	603	261.84	603	312.45	43	52	30-115	18	20
Batch number: 180860031A	Sample number(s): 9515656-9515664,9515666								
DX DRO C12-C24 w/ SiGel	603	178.47			30		30-115		
Batch number: 180890022A	Sample number(s): 9515650								
DX DRO C12-C24 w/ SiGel	603	180.39	603	619.63	30	103	30-115	110*	20

### MS/MSD

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc ug/l	MS Spike Added ug/l	MS Conc ug/l	MSD Spike Added ug/l	MSD Conc ug/l	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Batch number: 18085WAS026	Sample number(s): 9515647-9515664,9515666 UNSPK: 9515658									
Benzo(a)anthracene	N.D.	1.05	0.932	1.03	0.897	89	87	65-129	4	30
Benzo(a)pyrene	N.D.	1.05	0.830	1.03	0.811	79	79	65-126	2	30
Benzo(b)fluoranthene	N.D.	1.05	0.949	1.03	0.892	90	86	65-136	6	30
Benzo(k)fluoranthene	N.D.	1.05	0.871	1.03	0.865	83	84	65-131	1	30
Chrysene	N.D.	1.05	0.889	1.03	0.869	85	84	62-129	2	30
Dibenz(a,h)anthracene	N.D.	1.05	0.917	1.03	0.841	87	81	50-139	9	30
Indeno(1,2,3-cd)pyrene	N.D.	1.05	0.858	1.03	0.799	82	77	52-133	7	30
	ug/l	ug/l	ug/l	ug/l	ug/l					
Batch number: 18086A94A	Sample number(s): 9515647,9515655-9515666 UNSPK: 9515658									
Benzene	N.D.	20	20.9	20	20.83	105	104	80-120	0	30

\*- Outside of specification

(1) The result for one or both determinations was less than five times the LOQ.

(2) The unspiked result was more than four times the spike added.

P##### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

## Quality Control Summary

Client Name: Chevron Environmental Mgmt Co  
 Reported: 04/05/2018 14:54

Group Number: 1921956

### MS/MSD (continued)

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc ug/l	MS Spike Added ug/l	MS Conc ug/l	MSD Spike Added ug/l	MSD Conc ug/l	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
NWTPH-Gx water C7-C12	N.D.	1100	1550.19	1100	1512.37	141*	137*	80-120	2	30
Batch number: 180860031A      Sample number(s): 9515656-9515664,9515666 UNSPK: 9515658 DX DRO C12-C24 w/ SiGel      N.D.      610      216.43      608      189.71      35      31      30-115      13      20										

### Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: SIM SVOAs 8270C MINI  
 Batch number: 18085WAS026

	Fluoranthene-d10	Benzo(a)pyrene-d12	1-Methylnaphthalene-d10
9515647	94	67	66
9515648	74	86	75
9515649	75	61	68
9515650	73	90	71
9515651	72	80	63
9515652	77	81	66
9515653	74	84	72
9515654	78	70	70
9515655	63	79	99
9515656	71	67	52
9515657	75	85	57
9515658	67	67	65
9515659	68	75	74
9515660	76	75	73
9515661	78	72	75
9515662	74	59	77
9515663	72	78	68
9515664	78	81	69
9515666	52	91	114
Blank	82	93	74
LCS	81	95	80
MS	68	75	74
MSD	76	75	73
Limits:	43-130	23-144	31-121

\*- Outside of specification

(1) The result for one or both determinations was less than five times the LOQ.

(2) The unspiked result was more than four times the spike added.

P##### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

## Quality Control Summary

Client Name: Chevron Environmental Mgmt Co  
Reported: 04/05/2018 14:54

Group Number: 1921956

### Surrogate Quality Control (continued)

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: Method 8021 Water Master  
Batch number: 18085A94A

	Trifluorotoluene-P	Trifluorotoluene-F
9515648	83	78
9515649	81	76
9515650	83	78
9515651	82	78
9515652	82	77
9515653	81	77
9515654	92	91
Blank	81	77
LCS	82	93
LCSD	81	93
Limits:	51-120	50-150

Analysis Name: Method 8021 Water Master  
Batch number: 18086A94A

	Trifluorotoluene-P	Trifluorotoluene-F
9515647	81	78
9515655	75	77
9515656	79	78
9515657	81	77
9515658	82	78
9515659	81	103
9515660	80	102
9515661	81	77
9515662	81	78
9515663	82	78
9515664	83	78
9515665	82	78
9515666	77	80
Blank	82	78
LCS	80	98
MS	81	103
MSD	80	102
Limits:	51-120	50-150

Analysis Name: NWTPH-Dx water w/Si Gel  
Batch number: 180820009A

	Orthoterphenyl	Capric Acid
9515647	63	0
9515648	77	0
9515649	78	0

\*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

P##### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

## Quality Control Summary

Client Name: Chevron Environmental Mgmt Co  
Reported: 04/05/2018 14:54

Group Number: 1921956

### Surrogate Quality Control (continued)

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: NWTPH-Dx water w/Si Gel

Batch number: 180820009A

	Orthoterphenyl	Capric Acid
9515651	72	0
9515652	70	0
9515653	83	0
9515654	78	0
9515655	51	0
Blank	80	0
LCS	80	0
LCSD	82	0
Limits:	50-150	0-1

Analysis Name: NWTPH-Dx water w/Si Gel

Batch number: 180860031A

	Orthoterphenyl	Capric Acid
9515656	68	0
9515657	76	0
9515658	73	0
9515659	79	0
9515660	67	0
9515661	76	0
9515662	59	0
9515663	76	0
9515664	69	0
9515666	78	0
Blank	68	0
LCS	69	0
MS	79	0
MSD	67	0
Limits:	50-150	0-1

Analysis Name: NWTPH-Dx water w/Si Gel

Batch number: 180890022A

	Orthoterphenyl	Capric Acid
9515650	87	0
Blank	78	0
LCS	65	0
LCSD	63	0
Limits:	50-150	0-1

\*- Outside of specification

(1) The result for one or both determinations was less than five times the LOQ.

(2) The unspiked result was more than four times the spike added.

P##### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

# Chevron Northwest Region Analysis Request/Chain of Custody



**Lancaster Laboratories Environmental**

Acct. # 11964 For Eurofins Lancaster Laboratories Environmental use only  
 Group # 1921956 Sample # 9515047-66  
Instructions on reverse side correspond with circled numbers.

<b>1 Client Information</b>			<b>4 Matrix</b>			<b>5 Analyses Requested</b>											
Facility # <u>Edmonds Bulk Terminal</u> WBS <u>NWENUPM6001430802</u>			Sediment <input type="checkbox"/> Potable <input type="checkbox"/> Ground <input checked="" type="checkbox"/> NPDES <input type="checkbox"/> Surface <input type="checkbox"/> Oil <input type="checkbox"/> Air <input type="checkbox"/>			Total Number of Containers BTEX + MTBE 8021 <input type="checkbox"/> 8260 <input type="checkbox"/> Naphth <input type="checkbox"/> 8260 full scan Oxygenates NWTPH-Gx NWTPH-Dx with Silica Gel Cleanup <input checked="" type="checkbox"/> NWTPH-Dx without Silica Gel Cleanup <input type="checkbox"/> WA VPH <input type="checkbox"/> WA EPH <input type="checkbox"/> Lead Total <input type="checkbox"/> Diss. <input type="checkbox"/> Method <u>Benzene US EPA 8021R</u> <u>CPAH US EPA 8270 SIM</u>											
Site Address <u>11720 Unoco Rd Edmonds WA 98020</u>																	
Chevron PM <u>Kim Solitz</u> Lead Consultant																	
Consultant/Office <u>Arcadis</u>																	
Consultant Project Mgr. <u>Sam Aites Scott Zorn</u>																	
Consultant Phone # <u>206.726.4720 206.713.8292</u>																	
Sampler <u>Ryan Brauchla, Jason Little, Eric Krueger, Patrick Collins</u>																	

SCR #: \_\_\_\_\_

- Results in Dry Weight
- J value reporting needed
- Must meet lowest detection limits possible for 8260 compounds
- 8021 MTBE Confirmation
- Confirm MTBE + Naphthalene
- Confirm highest hit by 8260
- Confirm all hits by 8260
- Run \_\_\_\_\_ oxy's on highest hit
- Run \_\_\_\_\_ oxy's on all hits

Sample Identification	Collected		Grab	Composite	Soil	Water	Oil	Total Number of Containers	BTEX + MTBE	8260 full scan	Oxygenates	NWTPH-Gx	NWTPH-Dx with Silica Gel Cleanup	NWTPH-Dx without Silica Gel Cleanup	WA VPH	WA EPH	Lead	Total	Diss.	Method	Benzene US EPA 8021R	CPAH US EPA 8270 SIM
	Date	Time																				
LM-2	3/20/18	1425	X			X		7				X	X								X	X
MW-8R	3/20/18	1042	X			X		7				X	X								X	X
MW-104	3/20/18	1005	X			X		7				X	X								X	X
MW-129R	3/20/18	1612	X			X		7				X	X								X	X
MW-520	3/20/18	0930	X			X		7				X	X								X	X
MW-521	3/20/18	0950	X			X		7				X	X								X	X
MW-522	3/20/18	1055	X			X		7				X	X								X	X
MW-525	3/20/18	1210	X			X		7				X	X								X	X
MW-526	3/20/18	1340	X			X		7				X	X								X	X
MW-530	3/20/18	1418	X			X		7				X	X								X	X
MW-531	3/20/18	1250	X			X		7				X	X								X	X
MW-532	3/20/18	1115	X			X		7				X	X								X	X
MW-532-MS	3/20/18	1115	X			X		7				X	X								X	X

**6 Remarks**

**7 Turnaround Time Requested (TAT) (please circle)**

Standard 5 day 4 day  
 72 hour 48 hour 24 hour

Relinquished by _____	Date _____	Time _____	Received by _____	Date _____	Time _____
Relinquished by _____	Date _____	Time _____	Received by _____	Date _____	Time _____

**8 Data Package (circle if required)**

Type I - Full  
 Type VI (Raw Data)

**EDD (circle if required)**

CVX-RTBU-FI\_05 (default)  
 Other: \_\_\_\_\_

Relinquished by Commercial Carrier: UPS _____ FedEx <input checked="" type="checkbox"/> Other _____	Received by <u>Felix Gonzalez</u>	Date <u>3/21/18</u>	Time <u>12:40</u>
Temperature Upon Receipt <u>0.4 - 1.2 °C</u>	Custody Seals Intact? <u>Yes</u> No		



# Chevron Northwest Region Analysis Request/Chain of Custody



**Lancaster Laboratories Environmental**

Acct. # 11964

For Eurofins Lancaster Laboratories Environmental use only

Group # 1921956 Sample # 9515647-66

Instructions on reverse side correspond with circled numbers.

1 Client Information				4 Matrix				5 Analyses Requested											
Facility # <u>Edmonds Bulk Terminal NWENVPM6001430502</u>		WBS		Sediment <input type="checkbox"/> Ground <input checked="" type="checkbox"/> Surface <input type="checkbox"/>	Potable <input type="checkbox"/> NPDES <input type="checkbox"/> Air <input type="checkbox"/>	Water	Oil <input type="checkbox"/>	Total Number of Containers	BTEX + MTBE <input type="checkbox"/> 8260 full scan <input type="checkbox"/>	8260 <input type="checkbox"/> 8021 <input type="checkbox"/>	Naphth <input type="checkbox"/>	Oxygenates	NWTPH-Gx	NWTPH-Dx with Silica Gel Cleanup <input checked="" type="checkbox"/>	NWTPH-Dx without Silica Gel Cleanup <input type="checkbox"/>	WA VPH <input type="checkbox"/> WA EPH <input type="checkbox"/>	Lead <input type="checkbox"/> Total <input type="checkbox"/> Diss. <input type="checkbox"/> Method <input type="checkbox"/>	Benzene US EPA 80213	CPAH US EPA 8270 SIM
Site Address <u>11720 Unoco Rd Edmonds, WA 98020</u>		Chevron PM <u>Kim Jolitz</u>																	
Consultant/Office <u>Arcadis</u>		Lead Consultant																	
Consultant Project Mgr. <u>Sam Mites Scott Zorn</u>																			
Consultant Phone # <u>206.726.4730 206.713.8292</u>																			
Sampler <u>Ryan Brauchla, Jason Little, Eric Krueger, Patrick Collins</u>																			

SCR #: \_\_\_\_\_

- Results in Dry Weight
- J value reporting needed
- Must meet lowest detection limits possible for 8260 compounds
- 8021 MTBE Confirmation
- Confirm MTBE + Naphthalene
- Confirm highest hit by 8260
- Confirm all hits by 8260
- Run \_\_\_\_\_ oxy's on highest hit
- Run \_\_\_\_\_ oxy's on all hits

2 Sample Identification		3 Collected		Grab	Composite	Soil	Water	Oil	Total Number of Containers	BTEX + MTBE	8260	Naphth	Oxygenates	NWTPH-Gx	NWTPH-Dx with Silica Gel Cleanup	NWTPH-Dx without Silica Gel Cleanup	WA VPH	WA EPH	Lead	Total	Diss.	Method	Benzene US EPA 80213	CPAH US EPA 8270 SIM
Date	Time																							
MW-532-MSD	3/20/18	1115	X				X		7					X	X								X	X
MW-533-	3/20/18	1148	X				X		7					X	X								X	X
MW-534	3/20/18	1555	X				X		7					X	X							X	X	
MW-535	3/20/18	1145	X				X		7					X	X							X	X	
DUP-1	3/20/18	-	X				X		7					X	X							X	X	
Trip Blank	-	-							2															
MW-E-R	3/20/18	1405	X				X		7					X	X							X	X	

6 Remarks

7 Turnaround Time Requested (TAT) (please circle)

Standard 5 day      4 day

72 hour      48 hour      24 hour

Relinquished by _____	Date _____	Time _____	Received by _____	Date _____	Time _____
Relinquished by _____	Date _____	Time _____	Received by _____	Date _____	Time _____

8 Data Package (circle if required)

Type I - Full     

Type VI (Raw Data)     

EDD (circle if required)

CVX-RTBU-FI\_05 (default)     

Other: \_\_\_\_\_

Relinquished by Commercial Carrier:

UPS \_\_\_\_\_ FedEx  Other \_\_\_\_\_

Received by Felix Gonzalez      Date 3/21/18      Time 12:40

Temperature Upon Receipt 0.4 - 1.2 °C

Custody Seals Intact?      Yes      No



Client: Edmonds Bulk Terminal

**Delivery and Receipt Information**

Delivery Method:	<u>Fed Ex</u>	Arrival Timestamp:	<u>03/21/2018 12:40</u>
Number of Packages:	<u>4</u>	Number of Projects:	<u>1</u>
State/Province of Origin:	<u>WA</u>		

**Arrival Condition Summary**

Shipping Container Sealed:	Yes	Sample IDs on COC match Containers:	Yes
Custody Seal Present:	Yes	Sample Date/Times match COC:	Yes
Custody Seal Intact:	Yes	VOA Vial Headspace $\geq$ 6mm:	No
Samples Chilled:	Yes	Total Trip Blank Qty:	2
Paperwork Enclosed:	Yes	Trip Blank Type:	HCI
Samples Intact:	Yes	Air Quality Samples Present:	No
Missing Samples:	No		
Extra Samples:	No		
Discrepancy in Container Qty on COC:	No		

*Unpacked by Felix Gonzalez (13783) at 13:31 on 03/21/2018*

**Samples Chilled Details**

Thermometer Types: DT = Digital (Temp. Bottle) IR = Infrared (Surface Temp) All Temperatures in °C.

Cooler #	Thermometer ID	Corrected Temp	Therm. Type	Ice Type	Ice Present?	Ice Container	Elevated Temp?
1	DT42-01	0.4	DT	Wet	Y	Bagged	N
2	DT42-01	1.2	DT	Wet	Y	Bagged	N
3	DT42-01	0.7	DT	Wet	Y	Bagged	N
4	DT42-01	0.9	DT	Wet	Y	Bagged	N

# Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

<b>BMQL</b>	Below Minimum Quantitation Level	<b>mg</b>	milligram(s)
<b>C</b>	degrees Celsius	<b>mL</b>	milliliter(s)
<b>cfu</b>	colony forming units	<b>MPN</b>	Most Probable Number
<b>CP Units</b>	cobalt-chloroplatinate units	<b>N.D.</b>	non-detect
<b>F</b>	degrees Fahrenheit	<b>ng</b>	nanogram(s)
<b>g</b>	gram(s)	<b>NTU</b>	nephelometric turbidity units
<b>IU</b>	International Units	<b>pg/L</b>	picogram/liter
<b>kg</b>	kilogram(s)	<b>RL</b>	Reporting Limit
<b>L</b>	liter(s)	<b>TNTC</b>	Too Numerous To Count
<b>lb.</b>	pound(s)	<b>µg</b>	microgram(s)
<b>m3</b>	cubic meter(s)	<b>µL</b>	microliter(s)
<b>meq</b>	milliequivalents	<b>umhos/cm</b>	micromhos/cm
<b>&lt;</b>	less than		
<b>&gt;</b>	greater than		
<b>ppm</b>	parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.		
<b>ppb</b>	parts per billion		
<b>Dry weight basis</b>	Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.		

**Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.**

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

This report shall not be reproduced except in full, without the written approval of the laboratory.

Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as "analyze immediately" are not performed within 15 minutes.

**WARRANTY AND LIMITS OF LIABILITY** - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. THE FOREGOING EXPRESS WARRANTY IS EXCLUSIVE AND IS GIVEN IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. WE DISCLAIM ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING A WARRANTY OF FITNESS FOR PARTICULAR PURPOSE AND WARRANTY OF MERCHANTABILITY. IN NO EVENT SHALL EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL, LLC BE LIABLE FOR INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR LOSS OF PROFIT OR GOODWILL REGARDLESS OF (A) THE NEGLIGENCE (EITHER SOLE OR CONCURRENT) OF EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL AND (B) WHETHER EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL HAS BEEN INFORMED OF THE POSSIBILITY OF SUCH DAMAGES. We accept no legal responsibility for the purposes for which the client uses the test results. No purchase order or other order for work shall be accepted by Eurofins Lancaster Laboratories Environmental which includes any conditions that vary from the Standard Terms and Conditions, and Eurofins Lancaster Laboratories Environmental hereby objects to any conflicting terms contained in any acceptance or order submitted by client.

# Data Qualifiers

Qualifier	Definition
C	Result confirmed by reanalysis
D1	Indicates for dual column analyses that the result is reported from column 1
D2	Indicates for dual column analyses that the result is reported from column 2
E	Concentration exceeds the calibration range
J (or G, I, X)	Estimated value $\geq$ the Method Detection Limit (MDL or DL) and $<$ the Limit of Quantitation (LOQ or RL)
P	Concentration difference between the primary and confirmation column $>40\%$ . The lower result is reported.
U	Analyte was not detected at the value indicated
V	Concentration difference between the primary and confirmation column $>100\%$ . The reporting limit is raised due to this disparity and evident interference.
W	The dissolved oxygen uptake for the unseeded blank is greater than 0.20 mg/L.
Z	Laboratory Defined - see analysis report

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods. Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.



## ANALYSIS REPORT

Prepared by:

Eurofins Lancaster Laboratories Environmental  
2425 New Holland Pike  
Lancaster, PA 17601

Prepared for:

Chevron Environmental Mgmt Co  
BR1 X5139C  
6101 Bollinger Canyon Road  
San Ramon CA 94583

Report Date: April 09, 2018 15:48

### Project: Edmonds Terminal

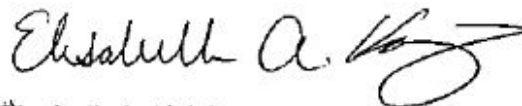
Account #: 11964  
Group Number: 1922345  
PO Number: 0015268291  
Release Number: JOLITZ  
State of Sample Origin: WA

Regulatory agencies do not accredit laboratories for all methods, analytes, and matrices. Our current scopes of accreditation can be viewed at <http://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster-laboratories-environmental/resources/certifications/>. To request copies of prior scopes of accreditation, contact your project manager.

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Attn: Eric Krueger  
Attn: Ryan Brauchla  
Attn: Ophelie Encelle  
Attn: Jason Little  
Attn: Sam Miles  
Attn: Scott Zorn

Respectfully Submitted,



Elisabeth A. Knisley  
Project Manager

(717) 556-7262



## SAMPLE INFORMATION

<u>Client Sample Description</u>	<u>Sample Collection Date/Time</u>	<u>ELLE#</u>
MW-502-W-180321 Grab Groundwater	03/21/2018 08:55	9517303
MW-503-W-180321 Grab Groundwater	03/21/2018 10:05	9517304
MW-504-W-180321 Grab Groundwater	03/21/2018 11:10	9517305
MW-505-W-180321 Grab Groundwater	03/21/2018 11:25	9517306
MW-506-W-180321 Grab Groundwater	03/21/2018 10:00	9517307
MW-507-W-180321 Grab Groundwater	03/21/2018 08:40	9517308
MW-509-W-180321 Grab Groundwater	03/21/2018 08:45	9517309
MW-511-W-180321 Grab Groundwater	03/21/2018 13:20	9517310
MW-512-W-180321 Grab Groundwater	03/21/2018 12:40	9517311
MW-513-W-180321 Grab Groundwater	03/21/2018 12:45	9517312
MW-514-W-180321 Grab Groundwater	03/21/2018 14:10	9517313
MW-515-W-180321 Grab Groundwater	03/21/2018 09:45	9517314
MW-516-W-180321 Grab Groundwater	03/21/2018 11:00	9517315
MW-516-W-180321 MS Grab Groundwater	03/21/2018 11:00	9517316
MW-516-W-180321 MSD Grab Groundwater	03/21/2018 11:00	9517317
MW-517-W-180321 Grab Groundwater	03/21/2018 12:10	9517318
MW-518-W-180321 Grab Groundwater	03/21/2018 13:05	9517319
DUP-2-W-180321 Grab Groundwater	03/21/2018	9517320
DUP-3-W-180321 Grab Groundwater	03/21/2018	9517321

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

**Sample Description:** MW-502-W-180321 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9517303  
**ELLE Group #:** 1922345  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 03/22/2018 11:00  
**Collection Date/Time:** 03/21/2018 08:55

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270C SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14243	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14243	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14243	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14243	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14243	Chrysene	218-01-9	N.D.	0.01	1
14243	Dibenz(a,h)anthracene	53-70-3	N.D.	0.01	1
14243	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	50	1
<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.2	1
<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	48	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	110	1

### Sample Comments

State of Washington Lab Certification No. C457  
Trip blank vials were not received by the laboratory for this sample group.  
Carcinogenic PAHs have been reported for this sample

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14243	SIM SVOAs 8270C MINI	SW-846 8270C SIM	1	18085WAS026	03/29/2018 02:02	Brandon K Cordova	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18085WAS026	03/27/2018 08:30	Logan M Brosemer	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18086A94A	03/28/2018 00:38	Marie D Beamenderfer	1
02102	Method 8021 Water Master	SW-846 8021B	1	18086A94A	03/28/2018 00:38	Marie D Beamenderfer	1
01146	GC VOA Water Prep	SW-846 5030B	1	18086A94A	03/28/2018 00:38	Marie D Beamenderfer	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	180930039A	04/06/2018 03:58	Amy Lehr	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	2	180930039A	04/04/2018 08:00	Kayla A Yuditsky	1

**Sample Description:** MW-503-W-180321 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9517304  
**ELLE Group #:** 1922345  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 03/22/2018 11:00  
**Collection Date/Time:** 03/21/2018 10:05

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270C SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14243	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14243	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14243	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14243	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14243	Chrysene	218-01-9	N.D.	0.01	1
14243	Dibenz(a,h)anthracene	53-70-3	N.D.	0.01	1
14243	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	50	1
<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.2	1
<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	48	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	110	1

### Sample Comments

State of Washington Lab Certification No. C457  
Trip blank vials were not received by the laboratory for this sample group.  
Carcinogenic PAHs have been reported for this sample

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14243	SIM SVOAs 8270C MINI	SW-846 8270C SIM	1	18085WAS026	03/29/2018 02:31	Brandon K Cordova	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18085WAS026	03/27/2018 08:30	Logan M Brosemer	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18086A94A	03/28/2018 01:04	Marie D Beamenderfer	1
02102	Method 8021 Water Master	SW-846 8021B	1	18086A94A	03/28/2018 01:04	Marie D Beamenderfer	1
01146	GC VOA Water Prep	SW-846 5030B	1	18086A94A	03/28/2018 01:04	Marie D Beamenderfer	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	180930039A	04/06/2018 04:21	Amy Lehr	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	2	180930039A	04/04/2018 08:00	Kayla A Yuditsky	1



**Sample Description:** MW-504-W-180321 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9517305  
**ELLE Group #:** 1922345  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 03/22/2018 11:00  
**Collection Date/Time:** 03/21/2018 11:10

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270C SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14243	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14243	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14243	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14243	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14243	Chrysene	218-01-9	N.D.	0.01	1
14243	Dibenz(a,h)anthracene	53-70-3	N.D.	0.01	1
14243	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	50	1
<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.2	1
<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	46	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1

### Sample Comments

State of Washington Lab Certification No. C457  
Trip blank vials were not received by the laboratory for this sample group.  
Carcinogenic PAHs have been reported for this sample

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14243	SIM SVOAs 8270C MINI	SW-846 8270C SIM	1	18085WAS026	03/29/2018 02:59	Brandon K Cordova	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18085WAS026	03/27/2018 08:30	Logan M Brosemer	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18086A94A	03/28/2018 01:29	Marie D Beamenderfer	1
02102	Method 8021 Water Master	SW-846 8021B	1	18086A94A	03/28/2018 01:29	Marie D Beamenderfer	1
01146	GC VOA Water Prep	SW-846 5030B	1	18086A94A	03/28/2018 01:29	Marie D Beamenderfer	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	180930039A	04/06/2018 04:43	Amy Lehr	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	2	180930039A	04/04/2018 08:00	Kayla A Yuditsky	1

**Sample Description:** MW-505-W-180321 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9517306  
**ELLE Group #:** 1922345  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 03/22/2018 11:00

**Collection Date/Time:** 03/21/2018 11:25

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270C SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14243	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14243	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14243	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14243	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14243	Chrysene	218-01-9	N.D.	0.01	1
14243	Dibenz(a,h)anthracene	53-70-3	N.D.	0.01	1
14243	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	50	1
<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.2	1
<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	47	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1

### Sample Comments

State of Washington Lab Certification No. C457  
Trip blank vials were not received by the laboratory for this sample group.  
Carcinogenic PAHs have been reported for this sample

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14243	SIM SVOAs 8270C MINI	SW-846 8270C SIM	1	18085WUAU026	03/28/2018 02:43	Catherine E Bachman	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18085WUAU026	03/27/2018 08:30	Logan M Brosemer	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18086A94A	03/28/2018 01:54	Marie D Beamenderfer	1
02102	Method 8021 Water Master	SW-846 8021B	1	18086A94A	03/28/2018 01:54	Marie D Beamenderfer	1
01146	GC VOA Water Prep	SW-846 5030B	1	18086A94A	03/28/2018 01:54	Marie D Beamenderfer	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	180930039A	04/06/2018 05:06	Amy Lehr	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	2	180930039A	04/04/2018 08:00	Kayla A Yuditsky	1

**Sample Description:** MW-506-W-180321 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9517307  
**ELLE Group #:** 1922345  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 03/22/2018 11:00  
**Collection Date/Time:** 03/21/2018 10:00

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>					
		<b>SW-846 8270C SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14243	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14243	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14243	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14243	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14243	Chrysene	218-01-9	N.D.	0.01	1
14243	Dibenz(a,h)anthracene	53-70-3	N.D.	0.01	1
14243	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>					
		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	50	1
<b>GC Volatiles</b>					
		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.2	1
<b>GC Petroleum Hydrocarbons w/Si</b>					
		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	46	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1

### Sample Comments

State of Washington Lab Certification No. C457  
Trip blank vials were not received by the laboratory for this sample group.  
Carcinogenic PAHs have been reported for this sample

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14243	SIM SVOAs 8270C MINI	SW-846 8270C SIM	1	18085WUAU026	03/28/2018 03:12	Catherine E Bachman	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18085WUAU026	03/27/2018 08:30	Logan M Brosemer	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18086A94A	03/28/2018 02:20	Marie D Beamenderfer	1
02102	Method 8021 Water Master	SW-846 8021B	1	18086A94A	03/28/2018 02:20	Marie D Beamenderfer	1
01146	GC VOA Water Prep	SW-846 5030B	1	18086A94A	03/28/2018 02:20	Marie D Beamenderfer	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	180930039A	04/06/2018 05:29	Amy Lehr	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	2	180930039A	04/04/2018 08:00	Kayla A Yuditsky	1

**Sample Description:** MW-507-W-180321 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9517308  
**ELLE Group #:** 1922345  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 03/22/2018 11:00  
**Collection Date/Time:** 03/21/2018 08:40

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270C SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14243	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14243	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14243	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14243	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14243	Chrysene	218-01-9	N.D.	0.01	1
14243	Dibenz(a,h)anthracene	53-70-3	N.D.	0.01	1
14243	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	50	1
<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.2	1
<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	47	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1

### Sample Comments

State of Washington Lab Certification No. C457  
Trip blank vials were not received by the laboratory for this sample group.  
Carcinogenic PAHs have been reported for this sample

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14243	SIM SVOAs 8270C MINI	SW-846 8270C SIM	1	18085WUAU026	03/28/2018 03:41	Catherine E Bachman	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18085WUAU026	03/27/2018 08:30	Logan M Brosemer	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18086A94A	03/28/2018 02:46	Marie D Beamenderfer	1
02102	Method 8021 Water Master	SW-846 8021B	1	18086A94A	03/28/2018 02:46	Marie D Beamenderfer	1
01146	GC VOA Water Prep	SW-846 5030B	1	18086A94A	03/28/2018 02:46	Marie D Beamenderfer	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	180880021A	04/04/2018 07:11	Amy Lehr	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	180880021A	03/30/2018 08:00	Logan M Brosemer	1

**Sample Description:** MW-509-W-180321 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9517309  
**ELLE Group #:** 1922345  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 03/22/2018 11:00  
**Collection Date/Time:** 03/21/2018 08:45

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270C SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14243	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14243	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14243	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14243	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14243	Chrysene	218-01-9	N.D.	0.01	1
14243	Dibenz(a,h)anthracene	53-70-3	N.D.	0.01	1
14243	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1

The recovery for the sample surrogate(s) is outside the QC acceptance limits as noted on the QC Summary. The following action was taken:  
The sample was re-extracted outside the method required holding time, but due to laboratory error the re-extract is not usable. The data is reported from the initial trial.

<b>GC Volatiles</b>		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	50	1

<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.2	1

<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	49	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	110	1

### Sample Comments

State of Washington Lab Certification No. C457  
Trip blank vials were not received by the laboratory for this sample group.  
Carcinogenic PAHs have been reported for this sample

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14243	SIM SVOAs 8270C MINI	SW-846 8270C SIM	1	18085WUAU026	03/28/2018 04:10	Catherine E Bachman	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18085WUAU026	03/27/2018 08:30	Logan M Brosemer	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18086A94A	03/28/2018 03:11	Marie D Beamenderfer	1
02102	Method 8021 Water Master	SW-846 8021B	1	18086A94A	03/28/2018 03:11	Marie D Beamenderfer	1
01146	GC VOA Water Prep	SW-846 5030B	1	18086A94A	03/28/2018 03:11	Marie D Beamenderfer	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	180880021A	04/04/2018 07:34	Amy Lehr	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	180880021A	03/30/2018 08:00	Logan M Brosemer	1

**Sample Description:** MW-511-W-180321 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9517310  
**ELLE Group #:** 1922345  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 03/22/2018 11:00  
**Collection Date/Time:** 03/21/2018 13:20

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270C SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14243	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14243	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14243	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14243	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14243	Chrysene	218-01-9	N.D.	0.01	1
14243	Dibenz(a,h)anthracene	53-70-3	N.D.	0.01	1
14243	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	50	1
<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.2	1
<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	46	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1

### Sample Comments

State of Washington Lab Certification No. C457  
Trip blank vials were not received by the laboratory for this sample group.  
Carcinogenic PAHs have been reported for this sample

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14243	SIM SVOAs 8270C MINI	SW-846 8270C SIM	1	18085WUAU026	03/28/2018 04:39	Catherine E Bachman	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18085WUAU026	03/27/2018 08:30	Logan M Brosemer	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18089A94A	03/30/2018 18:29	Marie D Beamenderfer	1
02102	Method 8021 Water Master	SW-846 8021B	1	18089A94A	03/30/2018 18:29	Marie D Beamenderfer	1
01146	GC VOA Water Prep	SW-846 5030B	1	18089A94A	03/30/2018 18:29	Marie D Beamenderfer	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	180880021A	04/04/2018 07:57	Amy Lehr	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	180880021A	03/30/2018 08:00	Logan M Brosemer	1

**Sample Description:** MW-512-W-180321 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9517311  
**ELLE Group #:** 1922345  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 03/22/2018 11:00  
**Collection Date/Time:** 03/21/2018 12:40

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270C SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14243	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14243	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14243	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14243	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14243	Chrysene	218-01-9	N.D.	0.01	1
14243	Dibenz(a,h)anthracene	53-70-3	N.D.	0.01	1
14243	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	50	1
<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.2	1
<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	46	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1

### Sample Comments

State of Washington Lab Certification No. C457  
Trip blank vials were not received by the laboratory for this sample group.  
Carcinogenic PAHs have been reported for this sample

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14243	SIM SVOAs 8270C MINI	SW-846 8270C SIM	1	18085WAU026	03/28/2018 05:08	Catherine E Bachman	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18085WAU026	03/27/2018 08:30	Logan M Brosemer	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18089A94A	03/30/2018 18:54	Marie D Beamenderfer	1
02102	Method 8021 Water Master	SW-846 8021B	1	18089A94A	03/30/2018 18:54	Marie D Beamenderfer	1
01146	GC VOA Water Prep	SW-846 5030B	1	18089A94A	03/30/2018 18:54	Marie D Beamenderfer	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	180880021A	04/04/2018 08:20	Amy Lehr	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	180880021A	03/30/2018 08:00	Logan M Brosemer	1

**Sample Description:** MW-513-W-180321 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9517312  
**ELLE Group #:** 1922345  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 03/22/2018 11:00  
**Collection Date/Time:** 03/21/2018 12:45

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270C SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14243	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14243	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14243	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14243	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14243	Chrysene	218-01-9	N.D.	0.01	1
14243	Dibenz(a,h)anthracene	53-70-3	N.D.	0.01	1
14243	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	50	1
<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.2	1
<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	240	47	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1

### Sample Comments

State of Washington Lab Certification No. C457  
Trip blank vials were not received by the laboratory for this sample group.  
Carcinogenic PAHs have been reported for this sample

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14243	SIM SVOAs 8270C MINI	SW-846 8270C SIM	1	18085WAU026	03/28/2018 05:37	Catherine E Bachman	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18085WAU026	03/27/2018 08:30	Logan M Brosemer	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18089A94A	03/30/2018 19:20	Marie D Beamenderfer	1
02102	Method 8021 Water Master	SW-846 8021B	1	18089A94A	03/30/2018 19:20	Marie D Beamenderfer	1
01146	GC VOA Water Prep	SW-846 5030B	1	18089A94A	03/30/2018 19:20	Marie D Beamenderfer	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	180880021A	04/04/2018 08:42	Amy Lehr	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	180880021A	03/30/2018 08:00	Logan M Brosemer	1



**Sample Description:** MW-514-W-180321 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9517313  
**ELLE Group #:** 1922345  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 03/22/2018 11:00

**Collection Date/Time:** 03/21/2018 14:10

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270C SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14243	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14243	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14243	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14243	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14243	Chrysene	218-01-9	N.D.	0.01	1
14243	Dibenz(a,h)anthracene	53-70-3	N.D.	0.01	1
14243	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	50	1
<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.2	1
<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	45	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1

### Sample Comments

State of Washington Lab Certification No. C457  
Trip blank vials were not received by the laboratory for this sample group.  
Carcinogenic PAHs have been reported for this sample

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14243	SIM SVOAs 8270C MINI	SW-846 8270C SIM	1	18085WUAU026	03/28/2018 06:06	Catherine E Bachman	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18085WUAU026	03/27/2018 08:30	Logan M Brosemer	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18089A94A	03/30/2018 19:46	Marie D Beamenderfer	1
02102	Method 8021 Water Master	SW-846 8021B	1	18089A94A	03/30/2018 19:46	Marie D Beamenderfer	1
01146	GC VOA Water Prep	SW-846 5030B	1	18089A94A	03/30/2018 19:46	Marie D Beamenderfer	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	180880021A	04/04/2018 09:51	Amy Lehr	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	180880021A	03/30/2018 08:00	Logan M Brosemer	1

**Sample Description:** MW-515-W-180321 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9517314  
**ELLE Group #:** 1922345  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 03/22/2018 11:00  
**Collection Date/Time:** 03/21/2018 09:45

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270C SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14243	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14243	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14243	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14243	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14243	Chrysene	218-01-9	N.D.	0.01	1
14243	Dibenz(a,h)anthracene	53-70-3	N.D.	0.01	1
14243	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	50	1
<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.2	1
<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	50	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	110	1

### Sample Comments

State of Washington Lab Certification No. C457  
Trip blank vials were not received by the laboratory for this sample group.  
Carcinogenic PAHs have been reported for this sample

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14243	SIM SVOAs 8270C MINI	SW-846 8270C SIM	1	18086WAE026	03/29/2018 03:55	Brandon K Cordova	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18086WAE026	03/27/2018 18:00	Osvaldo R Sanchez	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18089A94A	03/30/2018 20:11	Marie D Beamenderfer	1
02102	Method 8021 Water Master	SW-846 8021B	1	18089A94A	03/30/2018 20:11	Marie D Beamenderfer	1
01146	GC VOA Water Prep	SW-846 5030B	1	18089A94A	03/30/2018 20:11	Marie D Beamenderfer	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	180880021A	04/04/2018 10:13	Amy Lehr	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	180880021A	03/30/2018 08:00	Logan M Brosemer	1

**Sample Description:** MW-516-W-180321 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9517315  
**ELLE Group #:** 1922345  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 03/22/2018 11:00  
**Collection Date/Time:** 03/21/2018 11:00

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270C SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14243	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14243	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14243	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14243	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14243	Chrysene	218-01-9	N.D.	0.01	1
14243	Dibenz(a,h)anthracene	53-70-3	N.D.	0.01	1
14243	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	50	1
<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.2	1
<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	48	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	110	1

### Sample Comments

State of Washington Lab Certification No. C457  
Trip blank vials were not received by the laboratory for this sample group.  
Carcinogenic PAHs have been reported for this sample

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14243	SIM SVOAs 8270C MINI	SW-846 8270C SIM	1	18086WAE026	03/29/2018 04:23	Brandon K Cordova	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18086WAE026	03/27/2018 18:00	Osvaldo R Sanchez	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18089A94A	03/30/2018 21:02	Marie D Beamenderfer	1
02102	Method 8021 Water Master	SW-846 8021B	1	18089A94A	03/30/2018 21:02	Marie D Beamenderfer	1
01146	GC VOA Water Prep	SW-846 5030B	1	18089A94A	03/30/2018 21:02	Marie D Beamenderfer	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	180880021A	04/04/2018 06:03	Amy Lehr	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	180880021A	03/30/2018 08:00	Logan M Brosemer	1

**Sample Description:** MW-516-W-180321 MS Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9517316  
**ELLE Group #:** 1922345  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 03/22/2018 11:00  
**Collection Date/Time:** 03/21/2018 11:00

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270C SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14243	Benzo(a)anthracene	56-55-3	0.9	0.01	1
14243	Benzo(a)pyrene	50-32-8	1	0.01	1
14243	Benzo(b)fluoranthene	205-99-2	1	0.01	1
14243	Benzo(k)fluoranthene	207-08-9	1	0.01	1
14243	Chrysene	218-01-9	0.9	0.01	1
14243	Dibenz(a,h)anthracene	53-70-3	0.7	0.01	1
14243	Indeno(1,2,3-cd)pyrene	193-39-5	0.7	0.01	1
<b>GC Volatiles</b>		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	1,500	50	1
<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	21	0.2	1
<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	230	49	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	110	1

### Sample Comments

State of Washington Lab Certification No. C457  
Trip blank vials were not received by the laboratory for this sample group.  
Carcinogenic PAHs have been reported for this sample

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14243	SIM SVOAs 8270C MINI	SW-846 8270C SIM	1	18086WAE026	03/29/2018 04:51	Brandon K Cordova	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18086WAE026	03/27/2018 18:00	Osvaldo R Sanchez	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18089A94A	03/30/2018 22:19	Marie D Beamenderfer	1
02102	Method 8021 Water Master	SW-846 8021B	1	18089A94A	03/30/2018 21:28	Marie D Beamenderfer	1
01146	GC VOA Water Prep	SW-846 5030B	1	18089A94A	03/30/2018 21:28	Marie D Beamenderfer	1
01146	GC VOA Water Prep	SW-846 5030B	2	18089A94A	03/30/2018 22:19	Marie D Beamenderfer	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	180880021A	04/04/2018 06:26	Amy Lehr	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	180880021A	03/30/2018 08:00	Logan M Brosemer	1

**Sample Description:** MW-516-W-180321 MSD Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9517317  
**ELLE Group #:** 1922345  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 03/22/2018 11:00  
**Collection Date/Time:** 03/21/2018 11:00

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270C SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14243	Benzo(a)anthracene	56-55-3	0.9	0.01	1
14243	Benzo(a)pyrene	50-32-8	1	0.01	1
14243	Benzo(b)fluoranthene	205-99-2	1	0.01	1
14243	Benzo(k)fluoranthene	207-08-9	1	0.01	1
14243	Chrysene	218-01-9	0.9	0.01	1
14243	Dibenz(a,h)anthracene	53-70-3	0.7	0.01	1
14243	Indeno(1,2,3-cd)pyrene	193-39-5	0.7	0.01	1
<b>GC Volatiles</b>		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	1,500	50	1
<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	21	0.2	1
<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	190	48	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	110	1

### Sample Comments

State of Washington Lab Certification No. C457  
Trip blank vials were not received by the laboratory for this sample group.  
Carcinogenic PAHs have been reported for this sample

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14243	SIM SVOAs 8270C MINI	SW-846 8270C SIM	1	18086WAE026	03/29/2018 05:19	Brandon K Cordova	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18086WAE026	03/27/2018 18:00	Osvaldo R Sanchez	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18089A94A	03/30/2018 22:45	Marie D Beamenderfer	1
02102	Method 8021 Water Master	SW-846 8021B	1	18089A94A	03/30/2018 21:53	Marie D Beamenderfer	1
01146	GC VOA Water Prep	SW-846 5030B	1	18089A94A	03/30/2018 21:53	Marie D Beamenderfer	1
01146	GC VOA Water Prep	SW-846 5030B	2	18089A94A	03/30/2018 22:45	Marie D Beamenderfer	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	180880021A	04/04/2018 06:48	Amy Lehr	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	180880021A	03/30/2018 08:00	Logan M Brosemer	1

**Sample Description:** MW-517-W-180321 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9517318  
**ELLE Group #:** 1922345  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 03/22/2018 11:00  
**Collection Date/Time:** 03/21/2018 12:10

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270C SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14243	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14243	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14243	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14243	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14243	Chrysene	218-01-9	N.D.	0.01	1
14243	Dibenz(a,h)anthracene	53-70-3	N.D.	0.01	1
14243	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	50	1
<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.2	1
<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	49	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	110	1

### Sample Comments

State of Washington Lab Certification No. C457  
Trip blank vials were not received by the laboratory for this sample group.  
Carcinogenic PAHs have been reported for this sample

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14243	SIM SVOAs 8270C MINI	SW-846 8270C SIM	1	18086WAE026	03/29/2018 05:48	Brandon K Cordova	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18086WAE026	03/27/2018 18:00	Osvaldo R Sanchez	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18089A94A	03/30/2018 20:37	Marie D Beamenderfer	1
02102	Method 8021 Water Master	SW-846 8021B	1	18089A94A	03/30/2018 20:37	Marie D Beamenderfer	1
01146	GC VOA Water Prep	SW-846 5030B	1	18089A94A	03/30/2018 20:37	Marie D Beamenderfer	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	180880021A	04/04/2018 10:36	Amy Lehr	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	180880021A	03/30/2018 08:00	Logan M Brosemer	1

**Sample Description:** MW-518-W-180321 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9517319  
**ELLE Group #:** 1922345  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 03/22/2018 11:00  
**Collection Date/Time:** 03/21/2018 13:05

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270C SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14243	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14243	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14243	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14243	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14243	Chrysene	218-01-9	N.D.	0.01	1
14243	Dibenz(a,h)anthracene	53-70-3	N.D.	0.01	1
14243	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	220	50	1
<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.2	1
<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	48	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	110	1

### Sample Comments

State of Washington Lab Certification No. C457  
Trip blank vials were not received by the laboratory for this sample group.  
Carcinogenic PAHs have been reported for this sample

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14243	SIM SVOAs 8270C MINI	SW-846 8270C SIM	1	18086WAE026	03/29/2018 06:16	Brandon K Cordova	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18086WAE026	03/27/2018 18:00	Osvaldo R Sanchez	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18089A94A	03/31/2018 00:01	Marie D Beamenderfer	1
02102	Method 8021 Water Master	SW-846 8021B	1	18089A94A	03/31/2018 00:01	Marie D Beamenderfer	1
01146	GC VOA Water Prep	SW-846 5030B	1	18089A94A	03/31/2018 00:01	Marie D Beamenderfer	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	180880021A	04/04/2018 10:59	Amy Lehr	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	180880021A	03/30/2018 08:00	Logan M Brosemer	1

**Sample Description:** DUP-2-W-180321 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9517320  
**ELLE Group #:** 1922345  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 03/22/2018 11:00  
**Collection Date/Time:** 03/21/2018

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270C SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14243	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14243	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14243	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14243	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14243	Chrysene	218-01-9	N.D.	0.01	1
14243	Dibenz(a,h)anthracene	53-70-3	N.D.	0.01	1
14243	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	50	1
<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.2	1
<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	46	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1

### Sample Comments

State of Washington Lab Certification No. C457  
Trip blank vials were not received by the laboratory for this sample group.  
Carcinogenic PAHs have been reported for this sample

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14243	SIM SVOAs 8270C MINI	SW-846 8270C SIM	1	18086WAE026	03/29/2018 06:44	Brandon K Cordova	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18086WAE026	03/27/2018 18:00	Osvaldo R Sanchez	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18089A94A	03/31/2018 00:26	Marie D Beamenderfer	1
02102	Method 8021 Water Master	SW-846 8021B	1	18089A94A	03/31/2018 00:26	Marie D Beamenderfer	1
01146	GC VOA Water Prep	SW-846 5030B	1	18089A94A	03/31/2018 00:26	Marie D Beamenderfer	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	180890043A	04/05/2018 09:40	Amy Lehr	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	180890043A	04/02/2018 08:30	Joshua S Ruth	1



**Sample Description:** DUP-3-W-180321 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9517321  
**ELLE Group #:** 1922345  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 03/22/2018 11:00  
**Collection Date/Time:** 03/21/2018

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270C SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14243	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14243	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14243	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14243	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14243	Chrysene	218-01-9	N.D.	0.01	1
14243	Dibenz(a,h)anthracene	53-70-3	N.D.	0.01	1
14243	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	50	1
<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.2	1
<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	46	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1

### Sample Comments

State of Washington Lab Certification No. C457  
Trip blank vials were not received by the laboratory for this sample group.  
Carcinogenic PAHs have been reported for this sample

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14243	SIM SVOAs 8270C MINI	SW-846 8270C SIM	1	18086WAE026	03/29/2018 07:12	Brandon K Cordova	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18086WAE026	03/27/2018 18:00	Osvaldo R Sanchez	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18089A94A	03/31/2018 00:52	Marie D Beamenderfer	1
02102	Method 8021 Water Master	SW-846 8021B	1	18089A94A	03/31/2018 00:52	Marie D Beamenderfer	1
01146	GC VOA Water Prep	SW-846 5030B	1	18089A94A	03/31/2018 00:52	Marie D Beamenderfer	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	180890043A	04/05/2018 10:03	Amy Lehr	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	180890043A	04/02/2018 08:30	Joshua S Ruth	1

## Quality Control Summary

Client Name: Chevron Environmental Mgmt Co  
Reported: 04/09/2018 15:48

Group Number: 1922345

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

### Method Blank

Analysis Name	Result ug/l	MDL ug/l
Batch number: 18085WAS026	Sample number(s): 9517303-9517305	
Benzo(a)anthracene	N.D.	0.01
Benzo(a)pyrene	N.D.	0.01
Benzo(b)fluoranthene	N.D.	0.01
Benzo(k)fluoranthene	N.D.	0.01
Chrysene	N.D.	0.01
Dibenz(a,h)anthracene	N.D.	0.01
Indeno(1,2,3-cd)pyrene	N.D.	0.01
Batch number: 18085WAU026	Sample number(s): 9517306-9517313	
Benzo(a)anthracene	N.D.	0.01
Benzo(a)pyrene	N.D.	0.01
Benzo(b)fluoranthene	N.D.	0.01
Benzo(k)fluoranthene	N.D.	0.01
Chrysene	N.D.	0.01
Dibenz(a,h)anthracene	N.D.	0.01
Indeno(1,2,3-cd)pyrene	N.D.	0.01
Batch number: 18086WAE026	Sample number(s): 9517314-9517321	
Benzo(a)anthracene	N.D.	0.01
Benzo(a)pyrene	N.D.	0.01
Benzo(b)fluoranthene	N.D.	0.01
Benzo(k)fluoranthene	N.D.	0.01
Chrysene	N.D.	0.01
Dibenz(a,h)anthracene	N.D.	0.01
Indeno(1,2,3-cd)pyrene	N.D.	0.01
Batch number: 18086A94A	Sample number(s): 9517303-9517309	
Benzene	N.D.	0.2
NWTPH-Gx water C7-C12	N.D.	50
Batch number: 18089A94A	Sample number(s): 9517310-9517321	
Benzene	N.D.	0.2
NWTPH-Gx water C7-C12	N.D.	50
Batch number: 180880021A	Sample number(s): 9517308-9517319	
DX DRO C12-C24 w/ SiGel	N.D.	45
DX HRO C24-C40 w/ SiGel	N.D.	100
Batch number: 180890043A	Sample number(s): 9517320-9517321	
DX DRO C12-C24 w/ SiGel	N.D.	45
DX HRO C24-C40 w/ SiGel	N.D.	100

\*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

P##### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

## Quality Control Summary

Client Name: Chevron Environmental Mgmt Co  
Reported: 04/09/2018 15:48

Group Number: 1922345

### Method Blank (continued)

Analysis Name	Result ug/l	MDL ug/l
Batch number: 180930039A		
DX DRO C12-C24 w/ SiGel	N.D.	45
DX HRO C24-C40 w/ SiGel	N.D.	100

### LCS/LCSD

Analysis Name	LCS Spike Added ug/l	LCS Conc ug/l	LCSD Spike Added ug/l	LCSD Conc ug/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: 18085WAS026	Sample number(s): 9517303-9517305								
Benzo(a)anthracene	1.00	0.914			91		65-129		
Benzo(a)pyrene	1.00	0.983			98		65-126		
Benzo(b)fluoranthene	1.00	0.992			99		65-136		
Benzo(k)fluoranthene	1.00	0.948			95		65-131		
Chrysene	1.00	0.904			90		62-129		
Dibenz(a,h)anthracene	1.00	0.938			94		50-139		
Indeno(1,2,3-cd)pyrene	1.00	0.912			91		52-133		
Batch number: 18085WAU026	Sample number(s): 9517306-9517313								
Benzo(a)anthracene	1.00	0.786			79		65-129		
Benzo(a)pyrene	1.00	0.796			80		65-126		
Benzo(b)fluoranthene	1.00	0.779			78		65-136		
Benzo(k)fluoranthene	1.00	0.756			76		65-131		
Chrysene	1.00	0.726			73		62-129		
Dibenz(a,h)anthracene	1.00	0.797			80		50-139		
Indeno(1,2,3-cd)pyrene	1.00	0.777			78		52-133		
Batch number: 18086WAE026	Sample number(s): 9517314-9517321								
Benzo(a)anthracene	1.00	0.887			89		65-129		
Benzo(a)pyrene	1.00	1.01			101		65-126		
Benzo(b)fluoranthene	1.00	1.01			101		65-136		
Benzo(k)fluoranthene	1.00	1.00			100		65-131		
Chrysene	1.00	0.895			89		62-129		
Dibenz(a,h)anthracene	1.00	0.873			87		50-139		
Indeno(1,2,3-cd)pyrene	1.00	0.867			87		52-133		
	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>					
Batch number: 18086A94A	Sample number(s): 9517303-9517309								
Benzene	20	18.77			94		80-120		
NWTPH-Gx water C7-C12	1100	1298.25			118		80-120		
Batch number: 18089A94A	Sample number(s): 9517310-9517321								
Benzene	20	20.01			100		80-120		

\*- Outside of specification

(1) The result for one or both determinations was less than five times the LOQ.

(2) The unspiked result was more than four times the spike added.

P##### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

## Quality Control Summary

Client Name: Chevron Environmental Mgmt Co  
Reported: 04/09/2018 15:48

Group Number: 1922345

### LCS/LCSD (continued)

Analysis Name	LCS Spike Added ug/l	LCS Conc ug/l	LCSD Spike Added ug/l	LCSD Conc ug/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
NWTPH-Gx water C7-C12	1100	1322.64			120		80-120		
	ug/l	ug/l	ug/l	ug/l					
Batch number: 180880021A DX DRO C12-C24 w/ SiGel	Sample number(s): 9517308-9517319								
	603	187.41			31		30-115		
Batch number: 180890043A DX DRO C12-C24 w/ SiGel	Sample number(s): 9517320-9517321								
	603	220.81	603	213.67	37	35	30-115	3	20
Batch number: 180930039A DX DRO C12-C24 w/ SiGel	Sample number(s): 9517303-9517307								
	603	265.63	603	216.27	44	36	30-115	20	20

### MS/MSD

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc ug/l	MS Spike Added ug/l	MS Conc ug/l	MSD Spike Added ug/l	MSD Conc ug/l	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Batch number: 18085WAS026	Sample number(s): 9517303-9517305 UNSPK: P515658									
Benzo(a)anthracene	N.D.	1.05	0.932	1.03	0.897	89	87	65-129	4	30
Benzo(a)pyrene	N.D.	1.05	0.830	1.03	0.811	79	79	65-126	2	30
Benzo(b)fluoranthene	N.D.	1.05	0.949	1.03	0.892	90	86	65-136	6	30
Benzo(k)fluoranthene	N.D.	1.05	0.871	1.03	0.865	83	84	65-131	1	30
Chrysene	N.D.	1.05	0.889	1.03	0.869	85	84	62-129	2	30
Dibenz(a,h)anthracene	N.D.	1.05	0.917	1.03	0.841	87	81	50-139	9	30
Indeno(1,2,3-cd)pyrene	N.D.	1.05	0.858	1.03	0.799	82	77	52-133	7	30
Batch number: 18085WAU026	Sample number(s): 9517306-9517313 UNSPK: P517369									
Benzo(a)anthracene	N.D.	1.04	0.869	1.05	0.893	83	85	65-129	3	30
Benzo(a)pyrene	N.D.	1.04	0.800	1.05	0.830	77	79	65-126	4	30
Benzo(b)fluoranthene	N.D.	1.04	0.796	1.05	0.837	76	80	65-136	5	30
Benzo(k)fluoranthene	N.D.	1.04	0.747	1.05	0.791	72	75	65-131	6	30
Chrysene	N.D.	1.04	0.802	1.05	0.825	77	79	62-129	3	30
Dibenz(a,h)anthracene	N.D.	1.04	0.602	1.05	0.665	58	63	50-139	10	30
Indeno(1,2,3-cd)pyrene	N.D.	1.04	0.679	1.05	0.731	65	70	52-133	7	30
Batch number: 18086WAE026	Sample number(s): 9517314-9517321 UNSPK: 9517315									
Benzo(a)anthracene	N.D.	1.05	0.938	1.06	0.940	89	88	65-129	0	30
Benzo(a)pyrene	N.D.	1.05	1.01	1.06	0.992	96	93	65-126	2	30
Benzo(b)fluoranthene	N.D.	1.05	0.991	1.06	0.962	94	90	65-136	3	30
Benzo(k)fluoranthene	N.D.	1.05	0.989	1.06	1.01	94	95	65-131	3	30
Chrysene	N.D.	1.05	0.935	1.06	0.939	89	88	62-129	0	30

\*- Outside of specification

(1) The result for one or both determinations was less than five times the LOQ.

(2) The unspiked result was more than four times the spike added.

P##### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

## Quality Control Summary

Client Name: Chevron Environmental Mgmt Co  
Reported: 04/09/2018 15:48

Group Number: 1922345

### MS/MSD (continued)

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc ug/l	MS Spike Added ug/l	MS Conc ug/l	MSD Spike Added ug/l	MSD Conc ug/l	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Dibenz(a,h)anthracene	N.D.	1.05	0.747	1.06	0.719	71	68	50-139	4	30
Indeno(1,2,3-cd)pyrene	N.D.	1.05	0.696	1.06	0.658	66	62	52-133	6	30
	ug/l	ug/l	ug/l	ug/l	ug/l					
Batch number: 18086A94A	Sample number(s): 9517303-9517309 UNSPK: P515658									
Benzene	N.D.	20	20.9	20	20.83	105	104	80-120	0	30
NWTPH-Gx water C7-C12	N.D.	1100	1550.19	1100	1512.37	141*	137*	80-120	2	30
	ug/l	ug/l	ug/l	ug/l	ug/l					
Batch number: 18089A94A	Sample number(s): 9517310-9517321 UNSPK: 9517315									
Benzene	N.D.	20	20.88	20	21.18	104	106	80-120	1	30
NWTPH-Gx water C7-C12	N.D.	1100	1481.99	1100	1486.27	135*	135*	80-120	0	30
	ug/l	ug/l	ug/l	ug/l	ug/l					
Batch number: 180880021A	Sample number(s): 9517308-9517319 UNSPK: 9517315									
DX DRO C12-C24 w/ SiGel	N.D.	661	233.88	649	191.66	35	30	30-115	20	20

### Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: SIM SVOAs 8270C MINI  
Batch number: 18085WAS026

	Fluoranthene-d10	Benzo(a)pyrene-d12	1-Methylnaphthalene-d10
9517303	74	62	49
9517304	69	80	58
9517305	74	49	66
Blank	82	93	74
LCS	81	95	80
MS	68	75	74
MSD	76	75	73
Limits:	43-130	23-144	31-121

Analysis Name: SIM SVOAs 8270C MINI  
Batch number: 18085WAU026

	Fluoranthene-d10	Benzo(a)pyrene-d12	1-Methylnaphthalene-d10
9517306	64	70	78
9517307	76	64	68
9517308	70	80	64
9517309	71	15*	65

\*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

P##### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

## Quality Control Summary

Client Name: Chevron Environmental Mgmt Co  
Reported: 04/09/2018 15:48

Group Number: 1922345

### Surrogate Quality Control (continued)

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: SIM SVOAs 8270C MINI

Batch number: 18085WAU026

	Fluoranthene-d10	Benzo(a)pyrene-d12	1-Methylnaphthalene-d10
9517310	69	79	65
9517311	72	83	64
9517312	70	43	75
9517313	82	29	65
Blank	73	85	61
LCS	66	89	71
MS	70	85	84
MSD	81	86	81
Limits:	43-130	23-144	31-121

Analysis Name: SIM SVOAs 8270C MINI

Batch number: 18086WAE026

	Fluoranthene-d10	Benzo(a)pyrene-d12	1-Methylnaphthalene-d10
9517314	74	85	61
9517315	77	83	67
9517316	79	91	74
9517317	80	88	70
9517318	75	78	71
9517319	73	54	65
9517320	73	68	68
9517321	75	67	63
Blank	72	85	58
LCS	80	97	74
MS	79	91	74
MSD	80	88	70
Limits:	43-130	23-144	31-121

Analysis Name: Method 8021 Water Master

Batch number: 18086A94A

	Trifluorotoluene-P	Trifluorotoluene-F
9517303	82	78
9517304	82	78
9517305	81	77
9517306	81	78
9517307	83	85
9517308	82	78
9517309	81	78
Blank	82	78
LCS	80	98
MS	81	103

\*- Outside of specification

(1) The result for one or both determinations was less than five times the LOQ.

(2) The unspiked result was more than four times the spike added.

P##### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

## Quality Control Summary

Client Name: Chevron Environmental Mgmt Co  
Reported: 04/09/2018 15:48

Group Number: 1922345

### Surrogate Quality Control (continued)

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: Method 8021 Water Master  
Batch number: 18086A94A

	Trifluorotoluene-P	Trifluorotoluene-F
MSD	80	102
Limits:	51-120	50-150

Analysis Name: Method 8021 Water Master  
Batch number: 18089A94A

	Trifluorotoluene-P	Trifluorotoluene-F
9517310	82	78
9517311	82	77
9517312	82	78
9517313	82	78
9517314	82	78
9517315	82	78
9517316	81	97
9517317	81	97
9517318	82	78
9517319	82	80
9517320	82	90
9517321	82	78
Blank	82	79
LCS	81	93
MS	81	97
MSD	81	97
Limits:	51-120	50-150

Analysis Name: NWTPH-Dx water w/Si Gel  
Batch number: 180880021A

	Orthoterphenyl	Capric Acid
9517308	83	0
9517309	85	0
9517310	80	0
9517311	66	0
9517312	88	0
9517313	92	0
9517314	86	0
9517315	89	0
9517316	72	0
9517317	73	0
9517318	83	0
9517319	92	0
Blank	89	0

\*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

P##### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

## Quality Control Summary

Client Name: Chevron Environmental Mgmt Co  
Reported: 04/09/2018 15:48

Group Number: 1922345

### Surrogate Quality Control (continued)

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: NWTPH-Dx water w/Si Gel  
Batch number: 180880021A

	Orthoterphenyl	Capric Acid
LCS	70	0
MS	72	0
MSD	73	0
Limits:	50-150	0-1

Analysis Name: NWTPH-Dx water w/Si Gel  
Batch number: 180890043A

	Orthoterphenyl	Capric Acid
9517320	80	0
9517321	80	0
Blank	72	0
LCS	73	0
LCSD	60	0
Limits:	50-150	0-1

Analysis Name: NWTPH-Dx water w/Si Gel  
Batch number: 180930039A

	Orthoterphenyl	Capric Acid
9517303	86	0
9517304	83	0
9517305	79	0
9517306	80	0
9517307	75	0
Blank	75	0
LCS	72	0
LCSD	69	0
Limits:	50-150	0-1

\*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

P##### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.



# Chevron Northwest Region Analysis Request/Chain of Custody



**Lancaster Laboratories Environmental**

Acct. # 11904 For Eurofins Lancaster Laboratories Environmental use only  
 Group # 1922345 Sample # 9517303-21  
Instructions on reverse side correspond with circled numbers.

1 Client Information			4 Matrix			5 Analyses Requested										6 Remarks																																																																																																																																																																																																																																																																																																																																																														
Facility # <u>WBS</u> <u>Former unocal Edmonds Terminal</u>			<input type="checkbox"/> Sediment <input checked="" type="checkbox"/> Ground <input type="checkbox"/> Surface <input type="checkbox"/> Potable <input type="checkbox"/> NPDES <input type="checkbox"/> Air			Total Number of Containers BTEX + MTBE 8021 <input type="checkbox"/> 8260 <input type="checkbox"/> Naphth <input type="checkbox"/> 8260 full scan Oxygenates NWTPH-Gx NWTPH-Dx with Silica Gel Cleanup <input checked="" type="checkbox"/> NWTPH-Dx without Silica Gel Cleanup <input type="checkbox"/> WA VPH <input type="checkbox"/> WA EPH <input type="checkbox"/> Lead <input type="checkbox"/> Total <input type="checkbox"/> Diss. <input type="checkbox"/> Method <u>Benzene EPA 8021B</u> <u>CPAHs EPA 8270 SIM</u>										SCR #: _____																																																																																																																																																																																																																																																																																																																																																														
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Chevron PM <u>Kim Jolitz</u>																																																																																																																																																																																																																																																																																																																																																																														
Lead Consultant <u>Arcadis</u>																																																																																																																																																																																																																																																																																																																																																																														
Consultant/Office <u>1100 Olive Way, Suite 800, Seattle, WA 98101</u>																																																																																																																																																																																																																																																																																																																																																																														
Consultant Project Mgr. <u>Scott Zorn</u>			<input type="checkbox"/> Composite <input type="checkbox"/> Soil <input type="checkbox"/> Water <input type="checkbox"/> Oil			Results in Dry Weight <input type="checkbox"/> J value reporting needed <input type="checkbox"/> Must meet lowest detection limits possible for 8260 compounds <input type="checkbox"/> 8021 MTBE Confirmation <input type="checkbox"/> Confirm MTBE + Naphthalene <input type="checkbox"/> Confirm highest hit by 8260 <input type="checkbox"/> Confirm all hits by 8260 <input type="checkbox"/> Run ___ oxy's on highest hit <input type="checkbox"/> Run ___ oxy's on all hits <input type="checkbox"/>										<input type="checkbox"/> Results in Dry Weight <input type="checkbox"/> J value reporting needed <input type="checkbox"/> Must meet lowest detection limits possible for 8260 compounds <input type="checkbox"/> 8021 MTBE Confirmation <input type="checkbox"/> Confirm MTBE + Naphthalene <input type="checkbox"/> Confirm highest hit by 8260 <input type="checkbox"/> Confirm all hits by 8260 <input type="checkbox"/> Run ___ oxy's on highest hit <input type="checkbox"/> Run ___ oxy's on all hits																																																																																																																																																																																																																																																																																																																																																														
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Sampler <u>Eric Krueger, Patrick Collins, Ryan Brauchle</u>			Date Time			Grab Composite										Remarks																																																																																																																																																																																																																																																																																																																																																														
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<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 15%;">Sample ID</th> <th style="width: 15%;">Date</th> <th style="width: 15%;">Time</th> <th style="width: 5%;">Grab</th> <th style="width: 5%;">Composite</th> <th style="width: 5%;">Soil</th> <th style="width: 5%;">Water</th> <th style="width: 5%;">Oil</th> <th style="width: 5%;">Total Number of Containers</th> <th style="width: 5%;">BTEX + MTBE</th> <th style="width: 5%;">8021</th> <th style="width: 5%;">8260</th> <th style="width: 5%;">Naphth</th> <th style="width: 5%;">8260 full scan</th> <th style="width: 5%;">Oxygenates</th> <th style="width: 5%;">NWTPH-Gx</th> <th style="width: 5%;">NWTPH-Dx with Silica Gel Cleanup</th> <th style="width: 5%;">NWTPH-Dx without Silica Gel Cleanup</th> <th style="width: 5%;">WA VPH</th> <th style="width: 5%;">WA EPH</th> <th style="width: 5%;">Lead</th> <th style="width: 5%;">Total</th> <th style="width: 5%;">Diss.</th> <th style="width: 5%;">Method</th> <th style="width: 5%;">Benzene EPA 8021B</th> <th style="width: 5%;">CPAHs EPA 8270 SIM</th> </tr> <tr> <td>MW-502</td> <td>3/21/18</td> <td>0855</td> <td>X</td> <td></td> <td></td> <td>X</td> <td></td> <td>7</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>X</td> <td>X</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>X</td> <td>X</td> </tr> <tr><td>MW-503</td><td></td><td>1005</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>MW-504</td><td></td><td>1110</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>MW-505</td><td></td><td>1125</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>MW-506</td><td></td><td>1000</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>MW-507</td><td></td><td>0840</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>MW-509 * <u>SLWS 3-21-18</u></td><td></td><td>0845</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>MW-511</td><td></td><td>1320</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>MW-512</td><td></td><td>1240</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>MW-513</td><td></td><td>1245</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>MW-514</td><td></td><td>1410</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>MW-515 * <u>SLWS 3-21-18</u></td><td></td><td>0945</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>MW-516 * <u>SLWS 3-21-18</u></td><td></td><td>1100</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table>			Sample ID	Date	Time	Grab	Composite	Soil	Water	Oil	Total Number of Containers	BTEX + MTBE	8021	8260	Naphth	8260 full scan	Oxygenates	NWTPH-Gx	NWTPH-Dx with Silica Gel Cleanup	NWTPH-Dx without Silica Gel Cleanup	WA VPH	WA EPH	Lead	Total	Diss.	Method	Benzene EPA 8021B	CPAHs EPA 8270 SIM	MW-502	3/21/18	0855	X			X		7								X	X							X	X	MW-503		1005																								MW-504		1110																								MW-505		1125																								MW-506		1000																								MW-507		0840																								MW-509 * <u>SLWS 3-21-18</u>		0845																								MW-511		1320																								MW-512		1240																								MW-513		1245																								MW-514		1410																								MW-515 * <u>SLWS 3-21-18</u>		0945																								MW-516 * <u>SLWS 3-21-18</u>		1100																							
Sample ID	Date	Time	Grab	Composite	Soil	Water	Oil	Total Number of Containers	BTEX + MTBE	8021	8260	Naphth	8260 full scan	Oxygenates	NWTPH-Gx	NWTPH-Dx with Silica Gel Cleanup	NWTPH-Dx without Silica Gel Cleanup	WA VPH	WA EPH	Lead	Total	Diss.	Method	Benzene EPA 8021B	CPAHs EPA 8270 SIM																																																																																																																																																																																																																																																																																																																																																					
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Turnaround Time Requested (TAT) (please circle) <input checked="" type="radio"/> Standard 5 day    4 day 72 hour    48 hour    24 hour			Relinquished by <u>Ryan Brauchle</u>			Date <u>3/21/18</u>		Time <u>1600</u>		Received by <u>Fed Ex</u>			Date <u>3/21/18</u>		Time <u>1600</u>																																																																																																																																																																																																																																																																																																																																																															
Data Package (circle if required) <input checked="" type="radio"/> Type I - Full Type VI (Raw Data)			EDD (circle if required) CVX-RTBU-FL_05 (default)			Relinquished by Commercial Carrier: UPS _____ FedEx _____ Other _____			Received by <u>[Signature]</u>			Date <u>3/22/18</u>		Time <u>11:00</u>																																																																																																																																																																																																																																																																																																																																																																
Temperature Upon Receipt <u>0.7 - 1.0 °C</u>			Custody Seals Intact? <input checked="" type="radio"/> Yes <input type="radio"/> No																																																																																																																																																																																																																																																																																																																																																																											

The white copy should accompany samples to Eurofins Lancaster Laboratories Environmental. The yellow copy should be given to the SeaTac Courier. The pink copy should be retained by the client.

# Chevron Northwest Region Analysis Request/Chain of Custody



Lancaster Laboratories  
Environmental

Acct. # 11964

For Eurofins Lancaster Laboratories Environmental use only  
Group # 1982345 Sample # 9517303-21  
Instructions on reverse side correspond with circled numbers.

1 Client Information				4 Matrix				5 Analyses Requested												6 Remarks	
Facility # WBS Former Unocal Edmonds Terminal NWEN/PAH001430302 Site Address 11720 Unocal Rd, Edmonds, WA 98020 Chevron PM Kim Jolitz Lead Consultant Arcadis Consultant/Office 1100 Olive Way, Suite 800, Seattle, WA 98101 Consultant Project Mgr. Scott Zorn Consultant Phone # 206-713-8292 Sampler Eric Krueger, Patrick Collins, Ryan Branchuk				<input type="checkbox"/> Sediment <input checked="" type="checkbox"/> Ground <input type="checkbox"/> Surface <input type="checkbox"/> Potable <input type="checkbox"/> NPDES <input type="checkbox"/> Air				Total Number of Containers BTEX + MTBE 8021 <input type="checkbox"/> 8260 <input type="checkbox"/> Naphth <input type="checkbox"/> 8260 full scan Oxygenates NWTPH-Gx NWTPH-Dx with Silica Gel Cleanup <input checked="" type="checkbox"/> NWTPH-Dx without Silica Gel Cleanup <input type="checkbox"/> WA VPH <input type="checkbox"/> WA EPH <input type="checkbox"/> Lead <input type="checkbox"/> Total <input type="checkbox"/> Diss. <input type="checkbox"/> Method Benzene EPA 8021B CPAHs EPA 8270 SIM												SCR #: _____ <input type="checkbox"/> Results in Dry Weight <input type="checkbox"/> J value reporting needed <input type="checkbox"/> Must meet lowest detection limits possible for 8260 compounds <input type="checkbox"/> 8021 MTBE Confirmation <input type="checkbox"/> Confirm MTBE + Naphthalene <input type="checkbox"/> Confirm highest hit by 8260 <input type="checkbox"/> Confirm all hits by 8260 <input type="checkbox"/> Run _____ oxy's on highest hit <input type="checkbox"/> Run _____ oxy's on all hits	
2 Sample Identification		Collected		3														6			
		Date	Time	Grab	Composite																
MW-516-MS		3/21/18	1100	X														MW-501 - SLWS			
MW-516-MSD		3/21/18	1100	X														MW-515 - 3-21-18			
MW-517		3/21/18	1210	X														MW-516 (MS/MSD)			
MW-518		3/21/18	1305	X														MW-517			
DUP-2		3/21/18		X														MW-518 submitted on hold			
DUP-3		3/21/18		X														Email to ryan.branchuk@arcadis.com samuel.miles@arcadis.com scott.zorn@arcadis.com			
7 Turnaround Time Requested (TAT) (please circle)			Relinquished by			Date		Time		Received by			Date		Time						
Standard 5 day 4 day			Ryan Branchuk			3/21/18		1600		Fed Ex			3/21/18		1600						
72 hour 48 hour 24 hour			Relinquished by			Date		Time		Received by			Date		Time						
8 Data Package (circle if required)		EDD (circle if required)		Relinquished by Commercial Carrier:						Received by			Date		Time						
Type I - Full		CVX-RTBU-FI_05 (default)		UPS _____ FedEx _____ Other _____						MWR			3/23/18		11:00						
Type VI (Raw Data)		Other:		Temperature Upon Receipt 0.7-1.6 °C						Custody Seals Intact?			(Yes)		No						



Client: Chevron c/o Arcadis

**Delivery and Receipt Information**

Delivery Method: Fed Ex                      Arrival Timestamp: 03/22/2018 11:00  
 Number of Packages: 4                              Number of Projects: 1

**Arrival Condition Summary**

Shipping Container Sealed:	Yes	Sample IDs on COC match Containers:	Yes
Custody Seal Present:	Yes	Sample Date/Times match COC:	Yes
Custody Seal Intact:	Yes	VOA Vial Headspace $\geq$ 6mm:	No
Samples Chilled:	Yes	Total Trip Blank Qty:	0
Paperwork Enclosed:	Yes	Air Quality Samples Present:	No
Samples Intact:	Yes		
Missing Samples:	No		
Extra Samples:	No		
Discrepancy in Container Qty on COC:	No		

*Unpacked by Nicole Reiff (25684) at 14:17 on 03/22/2018*

**Samples Chilled Details**

Thermometer Types:    *DT = Digital (Temp. Bottle)    IR = Infrared (Surface Temp)*    All Temperatures in °C.

Cooler #	Thermometer ID	Corrected Temp	Therm. Type	Ice Type	Ice Present?	Ice Container	Elevated Temp?
1	DT146	1.6	DT	Wet	Y	Bagged	N
2	DT146	0.7	DT	Wet	Y	Bagged	N
3	DT146	0.7	DT	Wet	Y	Bagged	N
4	DT146	0.8	DT	Wet	Y	Bagged	N

# Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

<b>BMQL</b>	Below Minimum Quantitation Level	<b>mg</b>	milligram(s)
<b>C</b>	degrees Celsius	<b>mL</b>	milliliter(s)
<b>cfu</b>	colony forming units	<b>MPN</b>	Most Probable Number
<b>CP Units</b>	cobalt-chloroplatinate units	<b>N.D.</b>	non-detect
<b>F</b>	degrees Fahrenheit	<b>ng</b>	nanogram(s)
<b>g</b>	gram(s)	<b>NTU</b>	nephelometric turbidity units
<b>IU</b>	International Units	<b>pg/L</b>	picogram/liter
<b>kg</b>	kilogram(s)	<b>RL</b>	Reporting Limit
<b>L</b>	liter(s)	<b>TNTC</b>	Too Numerous To Count
<b>lb.</b>	pound(s)	<b>µg</b>	microgram(s)
<b>m3</b>	cubic meter(s)	<b>µL</b>	microliter(s)
<b>meq</b>	milliequivalents	<b>umhos/cm</b>	micromhos/cm
<b>&lt;</b>	less than		
<b>&gt;</b>	greater than		
<b>ppm</b>	parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.		
<b>ppb</b>	parts per billion		
<b>Dry weight basis</b>	Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.		

**Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.**

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

This report shall not be reproduced except in full, without the written approval of the laboratory.

Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as "analyze immediately" are not performed within 15 minutes.

**WARRANTY AND LIMITS OF LIABILITY** - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. THE FOREGOING EXPRESS WARRANTY IS EXCLUSIVE AND IS GIVEN IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. WE DISCLAIM ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING A WARRANTY OF FITNESS FOR PARTICULAR PURPOSE AND WARRANTY OF MERCHANTABILITY. IN NO EVENT SHALL EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL, LLC BE LIABLE FOR INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR LOSS OF PROFIT OR GOODWILL REGARDLESS OF (A) THE NEGLIGENCE (EITHER SOLE OR CONCURRENT) OF EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL AND (B) WHETHER EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL HAS BEEN INFORMED OF THE POSSIBILITY OF SUCH DAMAGES. We accept no legal responsibility for the purposes for which the client uses the test results. No purchase order or other order for work shall be accepted by Eurofins Lancaster Laboratories Environmental which includes any conditions that vary from the Standard Terms and Conditions, and Eurofins Lancaster Laboratories Environmental hereby objects to any conflicting terms contained in any acceptance or order submitted by client.

# Data Qualifiers

Qualifier	Definition
C	Result confirmed by reanalysis
D1	Indicates for dual column analyses that the result is reported from column 1
D2	Indicates for dual column analyses that the result is reported from column 2
E	Concentration exceeds the calibration range
J (or G, I, X)	Estimated value $\geq$ the Method Detection Limit (MDL or DL) and $<$ the Limit of Quantitation (LOQ or RL)
P	Concentration difference between the primary and confirmation column $>40\%$ . The lower result is reported.
U	Analyte was not detected at the value indicated
V	Concentration difference between the primary and confirmation column $>100\%$ . The reporting limit is raised due to this disparity and evident interference.
W	The dissolved oxygen uptake for the unseeded blank is greater than 0.20 mg/L.
Z	Laboratory Defined - see analysis report

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods. Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.



## ANALYSIS REPORT

Prepared by:

Eurofins Lancaster Laboratories Environmental  
2425 New Holland Pike  
Lancaster, PA 17601

Prepared for:

Chevron Environmental Mgmt Co  
BR1 X5139C  
6101 Bollinger Canyon Road  
San Ramon CA 94583

Report Date: April 06, 2018 10:59

### Project: Edmonds Terminal

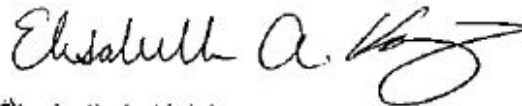
Account #: 11964  
Group Number: 1923075  
PO Number: 0015268291  
Release Number: JOLITZ  
State of Sample Origin: WA

Regulatory agencies do not accredit laboratories for all methods, analytes, and matrices. Our current scopes of accreditation can be viewed at <http://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster-laboratories-environmental/resources/certifications/>. To request copies of prior scopes of accreditation, contact your project manager.

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Attn: Eric Krueger  
Attn: Ryan Brauchla  
Attn: Ophelie Encelle  
Attn: Jason Little  
Attn: Sam Miles  
Attn: Scott Zorn

Respectfully Submitted,



Elisabeth A. Knisley  
Project Manager

(717) 556-7262



### SAMPLE INFORMATION

<u>Client Sample Description</u>	<u>Sample Collection Date/Time</u>	<u>ELLE#</u>
MW-20R-W-180322 Grab Groundwater	03/22/2018 11:10	9520769
MW-101-W-180322 Grab Groundwater	03/22/2018 09:40	9520770
MW-126-W-180322 Grab Groundwater	03/22/2018 09:55	9520771
MW-139R-W-180322 Grab Groundwater	03/22/2018 08:45	9520772
MW-143-W-180322 Grab Groundwater	03/22/2018 09:05	9520773
MW-519-W-180322 Grab Groundwater	03/22/2018 10:40	9520774
DUP-4-WD-180322 Grab Groundwater	03/22/2018	9520775

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

**Sample Description:** MW-20R-W-180322 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9520769  
**ELLE Group #:** 1923075  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 03/23/2018 10:15  
**Collection Date/Time:** 03/22/2018 11:10

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270C SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14243	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14243	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14243	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14243	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14243	Chrysene	218-01-9	N.D.	0.01	1
14243	Dibenz(a,h)anthracene	53-70-3	N.D.	0.01	1
14243	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	50	1
<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1
<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	46	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1

### Sample Comments

State of Washington Lab Certification No. C457  
Carcinogenic PAHs have been reported for this sample  
Trip blank vials were not received by the laboratory for this sample group.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14243	SIM SVOAs 8270C MINI	SW-846 8270C SIM	1	18086WAF026	03/28/2018 16:55	Catherine E Bachman	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18086WAF026	03/27/2018 18:00	Osvaldo R Sanchez	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18089A94A	03/31/2018 01:18	Marie D Beamenderfer	1
02102	Method 8021 Water Master	SW-846 8021B	1	18089A94A	03/31/2018 01:18	Marie D Beamenderfer	1
01146	GC VOA Water Prep	SW-846 5030B	1	18089A94A	03/31/2018 01:18	Marie D Beamenderfer	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	180890043A	04/05/2018 10:26	Amy Lehr	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	180890043A	04/02/2018 08:30	Joshua S Ruth	1



**Sample Description:** MW-101-W-180322 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9520770  
**ELLE Group #:** 1923075  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 03/23/2018 10:15  
**Collection Date/Time:** 03/22/2018 09:40

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270C SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14243	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14243	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14243	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14243	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14243	Chrysene	218-01-9	N.D.	0.01	1
14243	Dibenz(a,h)anthracene	53-70-3	N.D.	0.01	1
14243	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	50	1
<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1
<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	47	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	440	100	1

### Sample Comments

State of Washington Lab Certification No. C457  
Carcinogenic PAHs have been reported for this sample  
Trip blank vials were not received by the laboratory for this sample group.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14243	SIM SVOAs 8270C MINI	SW-846 8270C SIM	1	18086WAF026	03/28/2018 17:25	Catherine E Bachman	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18086WAF026	03/27/2018 18:00	Osvaldo R Sanchez	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18089A94A	03/31/2018 01:43	Marie D Beamenderfer	1
02102	Method 8021 Water Master	SW-846 8021B	1	18089A94A	03/31/2018 01:43	Marie D Beamenderfer	1
01146	GC VOA Water Prep	SW-846 5030B	1	18089A94A	03/31/2018 01:43	Marie D Beamenderfer	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	180890043A	04/05/2018 10:48	Amy Lehr	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	180890043A	04/02/2018 08:30	Joshua S Ruth	1

**Sample Description:** MW-126-W-180322 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9520771  
**ELLE Group #:** 1923075  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 03/23/2018 10:15  
**Collection Date/Time:** 03/22/2018 09:55

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270C SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14243	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14243	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14243	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14243	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14243	Chrysene	218-01-9	N.D.	0.01	1
14243	Dibenz(a,h)anthracene	53-70-3	N.D.	0.01	1
14243	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	50	1
<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1
<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	47	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	110	1

### Sample Comments

State of Washington Lab Certification No. C457  
Carcinogenic PAHs have been reported for this sample  
Trip blank vials were not received by the laboratory for this sample group.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14243	SIM SVOAs 8270C MINI	SW-846 8270C SIM	1	18086WAF026	03/28/2018 17:54	Catherine E Bachman	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18086WAF026	03/27/2018 18:00	Osvaldo R Sanchez	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18089A94A	03/31/2018 02:09	Marie D Beamenderfer	1
02102	Method 8021 Water Master	SW-846 8021B	1	18089A94A	03/31/2018 02:09	Marie D Beamenderfer	1
01146	GC VOA Water Prep	SW-846 5030B	1	18089A94A	03/31/2018 02:09	Marie D Beamenderfer	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	180890043A	04/05/2018 11:11	Amy Lehr	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	180890043A	04/02/2018 08:30	Joshua S Ruth	1

**Sample Description:** MW-139R-W-180322 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9520772  
**ELLE Group #:** 1923075  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 03/23/2018 10:15

**Collection Date/Time:** 03/22/2018 08:45

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270C SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14243	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14243	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14243	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14243	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14243	Chrysene	218-01-9	N.D.	0.01	1
14243	Dibenz(a,h)anthracene	53-70-3	N.D.	0.01	1
14243	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	50	1
<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1
<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	47	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1

### Sample Comments

State of Washington Lab Certification No. C457  
Carcinogenic PAHs have been reported for this sample  
Trip blank vials were not received by the laboratory for this sample group.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14243	SIM SVOAs 8270C MINI	SW-846 8270C SIM	1	18086WAF026	03/28/2018 18:23	Catherine E Bachman	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18086WAF026	03/27/2018 18:00	Osvaldo R Sanchez	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18089A94A	03/31/2018 02:34	Marie D Beamenderfer	1
02102	Method 8021 Water Master	SW-846 8021B	1	18089A94A	03/31/2018 02:34	Marie D Beamenderfer	1
01146	GC VOA Water Prep	SW-846 5030B	1	18089A94A	03/31/2018 02:34	Marie D Beamenderfer	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	180890043A	04/05/2018 11:34	Amy Lehr	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	180890043A	04/02/2018 08:30	Joshua S Ruth	1

**Sample Description:** MW-143-W-180322 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9520773  
**ELLE Group #:** 1923075  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 03/23/2018 10:15  
**Collection Date/Time:** 03/22/2018 09:05

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270C SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14243	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14243	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14243	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14243	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14243	Chrysene	218-01-9	N.D.	0.01	1
14243	Dibenz(a,h)anthracene	53-70-3	N.D.	0.01	1
14243	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	50	1
<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1
<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	46	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1

### Sample Comments

State of Washington Lab Certification No. C457  
Carcinogenic PAHs have been reported for this sample  
Trip blank vials were not received by the laboratory for this sample group.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14243	SIM SVOAs 8270C MINI	SW-846 8270C SIM	1	18086WAF026	03/28/2018 18:53	Catherine E Bachman	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18086WAF026	03/27/2018 18:00	Osvaldo R Sanchez	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18089A94A	03/31/2018 02:59	Marie D Beamenderfer	1
02102	Method 8021 Water Master	SW-846 8021B	1	18089A94A	03/31/2018 02:59	Marie D Beamenderfer	1
01146	GC VOA Water Prep	SW-846 5030B	1	18089A94A	03/31/2018 02:59	Marie D Beamenderfer	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	180890043A	04/05/2018 11:57	Amy Lehr	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	180890043A	04/02/2018 08:30	Joshua S Ruth	1

**Sample Description:** MW-519-W-180322 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9520774  
**ELLE Group #:** 1923075  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 03/23/2018 10:15  
**Collection Date/Time:** 03/22/2018 10:40

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270C SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14243	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14243	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14243	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14243	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14243	Chrysene	218-01-9	N.D.	0.01	1
14243	Dibenz(a,h)anthracene	53-70-3	N.D.	0.01	1
14243	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	50	1
<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1
<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	45	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1

### Sample Comments

State of Washington Lab Certification No. C457  
Carcinogenic PAHs have been reported for this sample  
Trip blank vials were not received by the laboratory for this sample group.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14243	SIM SVOAs 8270C MINI	SW-846 8270C SIM	1	18086WAF026	03/28/2018 19:22	Catherine E Bachman	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18086WAF026	03/27/2018 18:00	Oswaldo R Sanchez	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18089A94A	03/31/2018 03:25	Marie D Beamenderfer	1
02102	Method 8021 Water Master	SW-846 8021B	1	18089A94A	03/31/2018 03:25	Marie D Beamenderfer	1
01146	GC VOA Water Prep	SW-846 5030B	1	18089A94A	03/31/2018 03:25	Marie D Beamenderfer	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	180890043A	04/05/2018 12:19	Amy Lehr	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	180890043A	04/02/2018 08:30	Joshua S Ruth	1

**Sample Description:** DUP-4-WD-180322 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9520775  
**ELLE Group #:** 1923075  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 03/23/2018 10:15  
**Collection Date/Time:** 03/22/2018

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270C SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14243	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14243	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14243	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14243	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14243	Chrysene	218-01-9	N.D.	0.01	1
14243	Dibenz(a,h)anthracene	53-70-3	N.D.	0.01	1
14243	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	50	1
<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1
<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	45	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1

### Sample Comments

State of Washington Lab Certification No. C457  
Carcinogenic PAHs have been reported for this sample  
Trip blank vials were not received by the laboratory for this sample group.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14243	SIM SVOAs 8270C MINI	SW-846 8270C SIM	1	18086WAF026	03/28/2018 19:51	Catherine E Bachman	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18086WAF026	03/27/2018 18:00	Osvaldo R Sanchez	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18089A94A	03/31/2018 03:51	Marie D Beamenderfer	1
02102	Method 8021 Water Master	SW-846 8021B	1	18089A94A	03/31/2018 03:51	Marie D Beamenderfer	1
01146	GC VOA Water Prep	SW-846 5030B	1	18089A94A	03/31/2018 03:51	Marie D Beamenderfer	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	180890043A	04/05/2018 12:42	Amy Lehr	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	180890043A	04/02/2018 08:30	Joshua S Ruth	1

## Quality Control Summary

Client Name: Chevron Environmental Mgmt Co  
Reported: 04/06/2018 10:59

Group Number: 1923075

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

### Method Blank

Analysis Name	Result ug/l	MDL ug/l
Batch number: 18086WAF026	Sample number(s): 9520769-9520775	
Benzo(a)anthracene	N.D.	0.01
Benzo(a)pyrene	N.D.	0.01
Benzo(b)fluoranthene	N.D.	0.01
Benzo(k)fluoranthene	N.D.	0.01
Chrysene	N.D.	0.01
Dibenz(a,h)anthracene	N.D.	0.01
Indeno(1,2,3-cd)pyrene	N.D.	0.01
Batch number: 18089A94A	Sample number(s): 9520769-9520775	
Benzene	N.D.	0.2
NWTPH-Gx water C7-C12	N.D.	50
Batch number: 180890043A	Sample number(s): 9520769-9520775	
DX DRO C12-C24 w/ SiGel	N.D.	45
DX HRO C24-C40 w/ SiGel	N.D.	100

### LCS/LCSD

Analysis Name	LCS Spike Added ug/l	LCS Conc ug/l	LCSD Spike Added ug/l	LCSD Conc ug/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: 18086WAF026	Sample number(s): 9520769-9520775								
Benzo(a)anthracene	1.00	0.862			86		65-129		
Benzo(a)pyrene	1.00	0.918			92		65-126		
Benzo(b)fluoranthene	1.00	0.934			93		65-136		
Benzo(k)fluoranthene	1.00	0.874			87		65-131		
Chrysene	1.00	0.824			82		62-129		
Dibenz(a,h)anthracene	1.00	0.947			95		50-139		
Indeno(1,2,3-cd)pyrene	1.00	0.917			92		52-133		
	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>					
Batch number: 18089A94A	Sample number(s): 9520769-9520775								
Benzene	20	20.01			100		80-120		
NWTPH-Gx water C7-C12	1100	1322.64			120		80-120		
	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>					

\*- Outside of specification

(1) The result for one or both determinations was less than five times the LOQ.

(2) The unspiked result was more than four times the spike added.

P##### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

## Quality Control Summary

Client Name: Chevron Environmental Mgmt Co  
Reported: 04/06/2018 10:59

Group Number: 1923075

### LCS/LCSD (continued)

Analysis Name	LCS Spike Added ug/l	LCS Conc ug/l	LCSD Spike Added ug/l	LCSD Conc ug/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: 180890043A DX DRO C12-C24 w/ SiGel	Sample number(s): 9520769-9520775								
	603	220.81	603	213.67	37	35	30-115	3	20

### MS/MSD

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc ug/l	MS Spike Added ug/l	MS Conc ug/l	MSD Spike Added ug/l	MSD Conc ug/l	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Batch number: 18086WAF026	Sample number(s): 9520769-9520775 UNSPK: P517363									
Benzo(a)anthracene	N.D.	1.02	0.897	1.04	0.857	88	82	65-129	5	30
Benzo(a)pyrene	N.D.	1.02	0.787	1.04	0.760	77	73	65-126	4	30
Benzo(b)fluoranthene	N.D.	1.02	0.847	1.04	0.804	83	77	65-136	5	30
Benzo(k)fluoranthene	N.D.	1.02	0.788	1.04	0.765	77	73	65-131	3	30
Chrysene	N.D.	1.02	0.800	1.04	0.775	78	74	62-129	3	30
Dibenz(a,h)anthracene	N.D.	1.02	0.649	1.04	0.683	63	66	50-139	5	30
Indeno(1,2,3-cd)pyrene	N.D.	1.02	0.759	1.04	0.763	74	73	52-133	0	30
	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>					
Batch number: 18089A94A	Sample number(s): 9520769-9520775 UNSPK: P517315									
Benzene	N.D.	20	20.88	20	21.18	104	106	80-120	1	30
NWTPH-Gx water C7-C12	N.D.	1100	1481.99	1100	1486.27	135*	135*	80-120	0	30

### Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: SIM SVOAs 8270C MINI  
Batch number: 18086WAF026

	Fluoranthene-d10	Benzo(a)pyrene-d12	1-Methylnaphthalene-d10
9520769	63	54	65
9520770	75	88	64
9520771	66	91	62
9520772	78	88	64
9520773	56	51	62
9520774	72	73	76
9520775	73	78	73
Blank	80	93	69

\*- Outside of specification

(1) The result for one or both determinations was less than five times the LOQ.

(2) The unspiked result was more than four times the spike added.

P##### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.



## Quality Control Summary

Client Name: Chevron Environmental Mgmt Co  
Reported: 04/06/2018 10:59

Group Number: 1923075

### Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: SIM SVOAs 8270C MINI

Batch number: 18086WAF026

	Fluoranthene-d10	Benzo(a)pyrene-d12	1-Methylnaphthalene-d10
LCS	81	98	75
MS	76	86	98
MSD	78	82	92
Limits:	43-130	23-144	31-121

Analysis Name: Method 8021 Water Master

Batch number: 18089A94A

	Trifluorotoluene-P	Trifluorotoluene-F
9520769	83	84
9520770	83	78
9520771	83	78
9520772	83	78
9520773	83	77
9520774	83	77
9520775	83	77
Blank	82	79
LCS	81	93
MS	81	97
MSD	81	97
Limits:	51-120	50-150

Analysis Name: NWTPH-Dx water w/Si Gel

Batch number: 180890043A

	Orthoterphenyl	Capric Acid
9520769	67	0
9520770	74	0
9520771	73	0
9520772	73	0
9520773	63	0
9520774	68	0
9520775	63	0
Blank	72	0
LCS	73	0
LCSD	60	0
Limits:	50-150	0-1

\*- Outside of specification

(1) The result for one or both determinations was less than five times the LOQ.

(2) The unspiked result was more than four times the spike added.

P##### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

# Chevron Northwest Region Analysis Request/Chain of Custody



**Lancaster Laboratories Environmental**

Acct. # 11964

For Eurofins Lancaster Laboratories Environmental use only

Group # 1923075

Sample # 9520769-75

Instructions on reverse side correspond with circled numbers.

1 Client Information				4 Matrix				5 Analyses Requested												6 Remarks																			
Facility # <u>Former Unocal Edwards Terminal</u>		WBS <u>NWENVPM600430802</u>		Total Number of Containers	Sediment	<input type="checkbox"/>	Potable	<input type="checkbox"/>	Oil	<input type="checkbox"/>	Air	<input type="checkbox"/>	BTEX + MTBE	8021	<input type="checkbox"/>	8260	<input type="checkbox"/>	Naphth	<input type="checkbox"/>	Oxygenates	<input type="checkbox"/>	NWTPH-Gx	<input type="checkbox"/>	NWTPH-Dx with Silica Gel Cleanup	<input checked="" type="checkbox"/>	NWTPH-Dx without Silica Gel Cleanup	<input type="checkbox"/>	WA VPH	<input type="checkbox"/>	WA EPH	<input type="checkbox"/>	Lead	<input type="checkbox"/>	Total	<input type="checkbox"/>	Diss.	<input type="checkbox"/>	Method	<input type="checkbox"/>
Site Address <u>11720 Unoco Road, Edmonds, WA 98020</u>					Ground	<input checked="" type="checkbox"/>	NPDES	<input type="checkbox"/>	Benzene by EPA 8021B CPAHs by EPA 8270 SIM		SCR #: _____ <input type="checkbox"/> Results in Dry Weight <input type="checkbox"/> J value reporting needed <input type="checkbox"/> Must meet lowest detection limits possible for 8260 compounds <input type="checkbox"/> 8021 MTBE Confirmation <input type="checkbox"/> Confirm MTBE + Naphthalene <input type="checkbox"/> Confirm highest hit by 8260 <input type="checkbox"/> Confirm all hits by 8260 <input type="checkbox"/> Run _____ oxy's on highest hit <input type="checkbox"/> Run _____ oxy's on all hits																												
Chevron PM <u>Kim Jolitz</u>		Lead Consultant <u>Arcadis</u>			Surface	<input type="checkbox"/>	8021 MTBE Confirmation Confirm MTBE + Naphthalene Confirm highest hit by 8260 Confirm all hits by 8260 Run _____ oxy's on highest hit Run _____ oxy's on all hits																																
Consultant/Office <u>1100 Olive Way, Suite 800, Seattle, WA 98101</u>					Soil	<input type="checkbox"/>																																	
Consultant Project Mgr. <u>Scott Zorn</u>					Water	<input type="checkbox"/>																																	
Consultant Phone # <u>206.713.8292</u>					Composite	<input type="checkbox"/>																																	
Sampler <u>Ryan Brauchla, Patrick Collins</u>				Grab	<input type="checkbox"/>																																		
Date				Time	Date	Time			Email results to: ryan.brauchla@arcadis.com samuel.miles@arcadis.com scott.zorn@arcadis.com																														
Sample Identification		Collected		Date	Time	Date	Time																																
<u>MW-20R</u>		<u>3-22-18 1110</u>		<u>3-22-18</u>	<u>1110</u>	<u>3-22-18</u>	<u>1200</u>																																
<u>MW-101</u>		<u>3-22-18 0940</u>		<u>3-22-18</u>	<u>0940</u>	<u>3-22-18</u>	<u>1200</u>																																
<u>MW-126</u>		<u>3-22-18 0955</u>		<u>3-22-18</u>	<u>0955</u>	<u>3-22-18</u>	<u>1200</u>																																
<u>MW-139R</u>		<u>3-22-18 0845</u>		<u>3-22-18</u>	<u>0845</u>	<u>3-22-18</u>	<u>1200</u>																																
<u>MW-143</u>		<u>3-22-18 0905</u>		<u>3-22-18</u>	<u>0905</u>	<u>3-22-18</u>	<u>1200</u>																																
<u>MW-519</u>		<u>3-22-18 1040</u>		<u>3-22-18</u>	<u>1040</u>	<u>3-22-18</u>	<u>1200</u>																																
<u>DUP-4</u>		<u>3-22-18 —</u>		<u>3-22-18</u>	<u>—</u>	<u>3-22-18</u>	<u>1200</u>																																

7 Turnaround Time Requested (TAT) (please circle)

Standard 5 day    
  4 day  
 72 hour    
  48 hour    
  24 hour

Relinquished by [Signature] Date 3/22/18 Time 1200

Received by FedEx Date 3/22/18 Time 1200

8 Data Package (circle if required)

Type I - Full  
 Type VI (Raw Data)

Relinquished by Commercial Carrier:

UPS     
 FedEx     
 Other

Temperature Upon Receipt 1.0 °C

Received by [Signature] Date 3/23/18 Time 1015

Custody Seals Intact?  Yes      No



Client: Chevron c/o Arcadis

**Delivery and Receipt Information**

Delivery Method: Fed Ex                      Arrival Timestamp: 03/23/2018 10:15  
 Number of Packages: 1                              Number of Projects: 1

**Arrival Condition Summary**

Shipping Container Sealed:	Yes	Sample IDs on COC match Containers:	Yes
Custody Seal Present:	Yes	Sample Date/Times match COC:	Yes
Custody Seal Intact:	Yes	VOA Vial Headspace $\geq$ 6mm:	No
Samples Chilled:	Yes	Total Trip Blank Qty:	0
Paperwork Enclosed:	Yes	Air Quality Samples Present:	No
Samples Intact:	Yes		
Missing Samples:	No		
Extra Samples:	No		
Discrepancy in Container Qty on COC:	No		

*Unpacked by Nicole Reiff (25684) at 17:40 on 03/23/2018*

**Samples Chilled Details**

Thermometer Types:    *DT = Digital (Temp. Bottle)    IR = Infrared (Surface Temp)    All Temperatures in °C.*

<u>Cooler #</u>	<u>Thermometer ID</u>	<u>Corrected Temp</u>	<u>Therm. Type</u>	<u>Ice Type</u>	<u>Ice Present?</u>	<u>Ice Container</u>	<u>Elevated Temp?</u>
1	DT146	1.2	DT	Wet	Y	Bagged	N

# Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

<b>BMQL</b>	Below Minimum Quantitation Level	<b>mg</b>	milligram(s)
<b>C</b>	degrees Celsius	<b>mL</b>	milliliter(s)
<b>cfu</b>	colony forming units	<b>MPN</b>	Most Probable Number
<b>CP Units</b>	cobalt-chloroplatinate units	<b>N.D.</b>	non-detect
<b>F</b>	degrees Fahrenheit	<b>ng</b>	nanogram(s)
<b>g</b>	gram(s)	<b>NTU</b>	nephelometric turbidity units
<b>IU</b>	International Units	<b>pg/L</b>	picogram/liter
<b>kg</b>	kilogram(s)	<b>RL</b>	Reporting Limit
<b>L</b>	liter(s)	<b>TNTC</b>	Too Numerous To Count
<b>lb.</b>	pound(s)	<b>µg</b>	microgram(s)
<b>m3</b>	cubic meter(s)	<b>µL</b>	microliter(s)
<b>meq</b>	milliequivalents	<b>umhos/cm</b>	micromhos/cm
<b>&lt;</b>	less than		
<b>&gt;</b>	greater than		
<b>ppm</b>	parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.		
<b>ppb</b>	parts per billion		
<b>Dry weight basis</b>	Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.		

**Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.**

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

This report shall not be reproduced except in full, without the written approval of the laboratory.

Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as "analyze immediately" are not performed within 15 minutes.

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# Data Qualifiers

Qualifier	Definition
C	Result confirmed by reanalysis
D1	Indicates for dual column analyses that the result is reported from column 1
D2	Indicates for dual column analyses that the result is reported from column 2
E	Concentration exceeds the calibration range
J (or G, I, X)	Estimated value $\geq$ the Method Detection Limit (MDL or DL) and $<$ the Limit of Quantitation (LOQ or RL)
P	Concentration difference between the primary and confirmation column $>40\%$ . The lower result is reported.
U	Analyte was not detected at the value indicated
V	Concentration difference between the primary and confirmation column $>100\%$ . The reporting limit is raised due to this disparity and evident interference.
W	The dissolved oxygen uptake for the unseeded blank is greater than 0.20 mg/L.
Z	Laboratory Defined - see analysis report

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods. Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.



## ANALYSIS REPORT

Prepared by:

Eurofins Lancaster Laboratories Environmental  
2425 New Holland Pike  
Lancaster, PA 17601

Prepared for:

Chevron Environmental Mgmt Co  
BR1 X5139C  
6101 Bollinger Canyon Road  
San Ramon CA 94583

Report Date: July 19, 2018 12:14

### Project: Edmonds Terminal

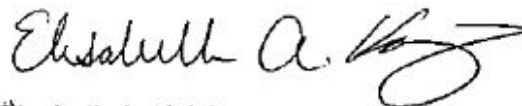
Account #: 11964  
Group Number: 1960331  
PO Number: 0015268291  
Release Number: JOLITZ  
State of Sample Origin: WA

To view our laboratory's current scopes of accreditation please go to <http://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster-laboratories-environmental/resources/certifications/>. Historical copies may be requested through your project manager.

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Attn: Eric Krueger  
Attn: Ophelie Encelle  
Attn: Ryan Brauchla  
Attn: Jason Little  
Attn: Sam Miles  
Attn: Scott Zorn

Respectfully Submitted,



Elisabeth A. Knisley  
Project Manager

(717) 556-7262



## SAMPLE INFORMATION

<u>Client Sample Description</u>	<u>Sample Collection Date/Time</u>	<u>ELLE#</u>
LM-2-W-180627 Grab Groundwater	06/27/2018 11:50	9681588
MW-104-W-180627 Grab Groundwater	06/27/2018 10:55	9681589
MW-129R-W-180627 Grab Groundwater	06/27/2018 12:25	9681590
MW-E-R-W-180627 Grab Groundwater	06/27/2018 13:00	9681591
MW-511-W-180627 Grab Groundwater	06/27/2018 13:30	9681592
MW-525-W-180627 Grab Groundwater	06/27/2018 09:20	9681593
MW-526-W-180627 Grab Groundwater	06/27/2018 09:00	9681594
MW-530-W-180627 Grab Groundwater	06/27/2018 11:55	9681595
MW-531-W-180627 Grab Groundwater	06/27/2018 09:30	9681596
MW-532-W-180627 Grab Groundwater	06/27/2018 09:45	9681597
MW-533-W-180627 Grab Groundwater	06/27/2018 10:00	9681598
MW-534-W-180627 Grab Groundwater	06/27/2018 13:10	9681599
MW-535-W-180627 Grab Groundwater	06/27/2018 11:15	9681600
MW-502-W-180627 Grab Groundwater	06/27/2018 15:00	9681601
MW-519-W-180627 Grab Groundwater	06/27/2018 14:20	9681602
DUP-1-WD-180627 Grab Groundwater	06/27/2018	9681603
Trip_Blank-T-180627 NA Water	06/27/2018	9681604

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

**Sample Description:** LM-2-W-180627 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9681588  
**ELLE Group #:** 1960331  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 06/28/2018 10:20  
**Collection Date/Time:** 06/27/2018 11:50

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270C SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14243	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14243	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14243	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14243	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14243	Chrysene	218-01-9	N.D.	0.01	1
14243	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14243	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	500	10
Reporting limits were raised due to sample foaming.					
<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	5.0	10
Reporting limits were raised due to sample foaming.					
<b>GC Miscellaneous</b>		<b>RSKSOP-175 modified</b>	<b>ug/l</b>	<b>ug/l</b>	
07105	Methane	74-82-8	670	15	5
<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	260	46	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	220	100	1
<b>Metals Dissolved</b>		<b>EPA 200.8 rev 5.4</b>	<b>ug/l</b>	<b>ug/l</b>	
06037	Manganese	7439-96-5	162	4.9	1
<b>Wet Chemistry</b>		<b>EPA 300.0</b>	<b>ug/l</b>	<b>ug/l</b>	
00368	Nitrate Nitrogen	14797-55-8	N.D.	250	5
00228	Sulfate	14808-79-8	133,000	15,000	50

### Sample Comments

State of Washington Lab Certification No. C457  
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14243	SIM SVOAs 8270C MINI	SW-846 8270C SIM	1	18183WAO026	07/05/2018 20:52	Brandon K Cordova	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18183WAO026	07/03/2018 10:00	Joshua S Ruth	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18186A94A	07/07/2018 06:31	Marie D Beamenderfer	10



**Sample Description:** LM-2-W-180627 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9681588  
**ELLE Group #:** 1960331  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submittal Date/Time:** 06/28/2018 10:20  
**Collection Date/Time:** 06/27/2018 11:50

## Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
02102	Method 8021 Water Master	SW-846 8021B	1	18186A94A	07/07/2018 06:31	Marie D Beamenderfer	10
01146	GC VOA Water Prep	SW-846 5030B	1	18186A94A	07/07/2018 06:31	Marie D Beamenderfer	10
07105	Volatile Headspace Hydrocarbon	RSKSOP-175 modified	1	181800002A	07/03/2018 02:36	Johanna C Kennedy	5
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	181800023A	07/06/2018 03:52	Amy Lehr	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	181800023A	07/02/2018 08:00	Joshua S Ruth	1
06037	Manganese	EPA 200.8 rev 5.4	1	181800705001A	07/12/2018 20:46	Bradley M Berlot	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	181800705001	07/01/2018 23:31	Denise L Trimby	1
00368	Nitrate Nitrogen	EPA 300.0	1	18179249106A	06/29/2018 07:12	Zachary W Enck	5
00228	Sulfate	EPA 300.0	1	18179249106A	06/29/2018 13:43	Zachary W Enck	50

**Sample Description:** MW-104-W-180627 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9681589  
**ELLE Group #:** 1960331  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 06/28/2018 10:20

**Collection Date/Time:** 06/27/2018 10:55

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>					
		<b>SW-846 8270C SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14243	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14243	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14243	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14243	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14243	Chrysene	218-01-9	N.D.	0.01	1
14243	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14243	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>					
		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	50	1
<b>GC Volatiles</b>					
		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1
<b>GC Miscellaneous</b>					
		<b>RSKSOP-175 modified</b>	<b>ug/l</b>	<b>ug/l</b>	
07105	Methane	74-82-8	280	3.0	1
<b>GC Petroleum Hydrocarbons w/Si</b>					
		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	46	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1
<b>Metals Dissolved</b>					
		<b>EPA 200.8 rev 5.4</b>	<b>ug/l</b>	<b>ug/l</b>	
06037	Manganese	7439-96-5	339	4.9	1
<b>Wet Chemistry</b>					
		<b>EPA 300.0</b>	<b>ug/l</b>	<b>ug/l</b>	
00368	Nitrate Nitrogen	14797-55-8	N.D.	250	5
00228	Sulfate	14808-79-8	13,000	1,500	5

### Sample Comments

State of Washington Lab Certification No. C457  
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14243	SIM SVOAs 8270C MINI	SW-846 8270C SIM	1	18183WAO026	07/05/2018 21:19	Brandon K Cordova	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18183WAO026	07/03/2018 10:00	Joshua S Ruth	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18179B94A	07/01/2018 16:31	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18179B94A	07/01/2018 16:31	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18179B94A	07/01/2018 16:31	Jeremy C Giffin	1

**Sample Description:** MW-104-W-180627 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9681589  
**ELLE Group #:** 1960331  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 06/28/2018 10:20

**Collection Date/Time:** 06/27/2018 10:55

## Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07105	Volatile Headspace Hydrocarbon	RSKSOP-175 modified	1	181800002A	06/29/2018 13:47	Johanna C Kennedy	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	181800023A	07/06/2018 04:16	Amy Lehr	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	181800023A	07/02/2018 08:00	Joshua S Ruth	1
06037	Manganese	EPA 200.8 rev 5.4	1	181800705001A	07/12/2018 20:48	Bradley M Berlot	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	181800705001	07/01/2018 23:31	Denise L Trimby	1
00368	Nitrate Nitrogen	EPA 300.0	1	18179249106A	06/29/2018 06:01	Zachary W Enck	5
00228	Sulfate	EPA 300.0	1	18179249106A	06/29/2018 06:01	Zachary W Enck	5

**Sample Description:** MW-129R-W-180627 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9681590  
**ELLE Group #:** 1960331  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 06/28/2018 10:20  
**Collection Date/Time:** 06/27/2018 12:25

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>					
<b>SW-846 8270C SIM</b>			<b>ug/l</b>	<b>ug/l</b>	
14243	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14243	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14243	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14243	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14243	Chrysene	218-01-9	N.D.	0.01	1
14243	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14243	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>					
<b>ECY 97-602 NWTPH-Gx</b>			<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	50	1
<b>GC Volatiles</b>					
<b>SW-846 8021B</b>			<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1
<b>GC Miscellaneous</b>					
<b>RSKSOP-175 modified</b>			<b>ug/l</b>	<b>ug/l</b>	
07105	Methane	74-82-8	2,900	60	20
<b>GC Petroleum Hydrocarbons w/Si</b>					
<b>ECY 97-602 NWTPH-Dx modified</b>			<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	47	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1
<b>Metals Dissolved</b>					
<b>EPA 200.8 rev 5.4</b>			<b>ug/l</b>	<b>ug/l</b>	
06037	Manganese	7439-96-5	8,530	48.8	10
<b>Wet Chemistry</b>					
<b>EPA 300.0</b>			<b>ug/l</b>	<b>ug/l</b>	
00368	Nitrate Nitrogen	14797-55-8	N.D.	250	5
00228	Sulfate	14808-79-8	87,600	15,000	50

### Sample Comments

State of Washington Lab Certification No. C457  
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14243	SIM SVOAs 8270C MINI	SW-846 8270C SIM	1	18183WAO026	07/05/2018 21:47	Brandon K Cordova	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18183WAO026	07/03/2018 10:00	Joshua S Ruth	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18179B94A	07/01/2018 16:56	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18179B94A	07/01/2018 16:56	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18179B94A	07/01/2018 16:56	Jeremy C Giffin	1

**Sample Description:** MW-129R-W-180627 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9681590  
**ELLE Group #:** 1960331  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 06/28/2018 10:20  
**Collection Date/Time:** 06/27/2018 12:25

## Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07105	Volatile Headspace Hydrocarbon	RSKSOP-175 modified	1	181800002A	07/03/2018 02:53	Johanna C Kennedy	20
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	181800023A	07/06/2018 04:39	Amy Lehr	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	181800023A	07/02/2018 08:00	Joshua S Ruth	1
06037	Manganese	EPA 200.8 rev 5.4	1	181800705001A	07/16/2018 08:17	Choon Y Tian	10
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	181800705001	07/01/2018 23:31	Denise L Trimby	1
00368	Nitrate Nitrogen	EPA 300.0	1	18179249106A	06/29/2018 09:52	Zachary W Enck	5
00228	Sulfate	EPA 300.0	1	18179249106A	06/29/2018 14:00	Zachary W Enck	50

**Sample Description:** MW-E-R-W-180627 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9681591  
**ELLE Group #:** 1960331  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 06/28/2018 10:20

**Collection Date/Time:** 06/27/2018 13:00

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>					
		<b>SW-846 8270C SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14243	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14243	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14243	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14243	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14243	Chrysene	218-01-9	N.D.	0.01	1
14243	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14243	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>					
		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	510	50	1
<b>GC Volatiles</b>					
		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1
<b>GC Miscellaneous</b>					
		<b>RSKSOP-175 modified</b>	<b>ug/l</b>	<b>ug/l</b>	
07105	Methane	74-82-8	23,000	300	100
<b>GC Petroleum Hydrocarbons w/Si</b>					
		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	59	49	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	110	1
<b>Metals Dissolved</b>					
		<b>EPA 200.8 rev 5.4</b>	<b>ug/l</b>	<b>ug/l</b>	
06037	Manganese	7439-96-5	11,800	48.8	10
<b>Wet Chemistry</b>					
		<b>EPA 300.0</b>	<b>ug/l</b>	<b>ug/l</b>	
00368	Nitrate Nitrogen	14797-55-8	N.D.	250	5
00228	Sulfate	14808-79-8	N.D.	1,500	5

### Sample Comments

State of Washington Lab Certification No. C457  
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14243	SIM SVOAs 8270C MINI	SW-846 8270C SIM	1	18183WAO026	07/05/2018 22:15	Brandon K Cordova	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18183WAO026	07/03/2018 10:00	Joshua S Ruth	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18179B94A	07/01/2018 17:21	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18179B94A	07/01/2018 17:21	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18179B94A	07/01/2018 17:21	Jeremy C Giffin	1

**Sample Description:** MW-E-R-W-180627 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9681591  
**ELLE Group #:** 1960331  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submittal Date/Time:** 06/28/2018 10:20  
**Collection Date/Time:** 06/27/2018 13:00

## Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07105	Volatile Headspace Hydrocarbon	RSKSOP-175 modified	1	181800002A	07/03/2018 03:10	Johanna C Kennedy	100
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	181800023A	07/06/2018 05:02	Amy Lehr	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	181800023A	07/02/2018 08:00	Joshua S Ruth	1
06037	Manganese	EPA 200.8 rev 5.4	1	181800705001A	07/16/2018 08:23	Choon Y Tian	10
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	181800705001	07/01/2018 23:31	Denise L Trimby	1
00368	Nitrate Nitrogen	EPA 300.0	1	18179249106A	06/29/2018 10:10	Zachary W Enck	5
00228	Sulfate	EPA 300.0	1	18179249106A	06/29/2018 10:10	Zachary W Enck	5

**Sample Description:** MW-511-W-180627 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9681592  
**ELLE Group #:** 1960331  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 06/28/2018 10:20  
**Collection Date/Time:** 06/27/2018 13:30

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>					
<b>SW-846 8270C SIM</b>			<b>ug/l</b>	<b>ug/l</b>	
14243	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14243	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14243	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14243	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14243	Chrysene	218-01-9	N.D.	0.01	1
14243	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14243	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>					
<b>ECY 97-602 NWTPH-Gx</b>			<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	50	1
<b>GC Volatiles</b>					
<b>SW-846 8021B</b>			<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1
<b>GC Miscellaneous</b>					
<b>RSKSOP-175 modified</b>			<b>ug/l</b>	<b>ug/l</b>	
07105	Methane	74-82-8	N.D.	3.0	1
<b>GC Petroleum Hydrocarbons w/Si</b>					
<b>ECY 97-602 NWTPH-Dx modified</b>			<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	46	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1
<b>Metals Dissolved</b>					
<b>EPA 200.8 rev 5.4</b>			<b>ug/l</b>	<b>ug/l</b>	
06037	Manganese	7439-96-5	56.1	4.9	1
<b>Wet Chemistry</b>					
<b>EPA 300.0</b>			<b>ug/l</b>	<b>ug/l</b>	
00368	Nitrate Nitrogen	14797-55-8	N.D.	250	5
00228	Sulfate	14808-79-8	22,600	1,500	5

### Sample Comments

State of Washington Lab Certification No. C457  
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14243	SIM SVOAs 8270C MINI	SW-846 8270C SIM	1	18183WAO026	07/05/2018 22:43	Brandon K Cordova	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18183WAO026	07/03/2018 10:00	Joshua S Ruth	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18179B94A	07/01/2018 17:47	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18179B94A	07/01/2018 17:47	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18179B94A	07/01/2018 17:47	Jeremy C Giffin	1



**Sample Description:** MW-511-W-180627 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9681592  
**ELLE Group #:** 1960331  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 06/28/2018 10:20

**Collection Date/Time:** 06/27/2018 13:30

## Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07105	Volatile Headspace Hydrocarbon	RSKSOP-175 modified	1	181800002A	07/06/2018 19:26	Johanna C Kennedy	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	181800023A	07/06/2018 05:25	Amy Lehr	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	181800023A	07/02/2018 08:00	Joshua S Ruth	1
06037	Manganese	EPA 200.8 rev 5.4	1	181800705001A	07/12/2018 20:37	Bradley M Berlot	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	181800705001	07/01/2018 23:31	Denise L Trimby	1
00368	Nitrate Nitrogen	EPA 300.0	1	18179249106A	06/29/2018 10:27	Zachary W Enck	5
00228	Sulfate	EPA 300.0	1	18179249106A	06/29/2018 10:27	Zachary W Enck	5

**Sample Description:** MW-525-W-180627 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9681593  
**ELLE Group #:** 1960331  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 06/28/2018 10:20  
**Collection Date/Time:** 06/27/2018 09:20

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>					
<b>SW-846 8270C SIM</b>			<b>ug/l</b>	<b>ug/l</b>	
14243	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14243	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14243	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14243	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14243	Chrysene	218-01-9	N.D.	0.01	1
14243	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14243	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>					
<b>ECY 97-602 NWTPH-Gx</b>			<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	1,000	50	1
<b>GC Volatiles</b>					
<b>SW-846 8021B</b>			<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	6.0	0.5	1
<b>GC Miscellaneous</b>					
<b>RSKSOP-175 modified</b>			<b>ug/l</b>	<b>ug/l</b>	
07105	Methane	74-82-8	1,900	30	10
<b>GC Petroleum Hydrocarbons w/Si</b>					
<b>ECY 97-602 NWTPH-Dx modified</b>			<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	46	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1
<b>Metals Dissolved</b>					
<b>EPA 200.8 rev 5.4</b>			<b>ug/l</b>	<b>ug/l</b>	
06037	Manganese	7439-96-5	4,210	24.4	5
<b>Wet Chemistry</b>					
<b>EPA 300.0</b>			<b>ug/l</b>	<b>ug/l</b>	
00368	Nitrate Nitrogen	14797-55-8	N.D.	250	5
00228	Sulfate	14808-79-8	453,000	30,000	100

### Sample Comments

State of Washington Lab Certification No. C457  
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14243	SIM SVOAs 8270C MINI	SW-846 8270C SIM	1	18183WAO026	07/05/2018 23:11	Brandon K Cordova	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18183WAO026	07/03/2018 10:00	Joshua S Ruth	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18179B94A	07/01/2018 18:13	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18179B94A	07/01/2018 18:13	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18179B94A	07/01/2018 18:13	Jeremy C Giffin	1

**Sample Description:** MW-525-W-180627 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9681593  
**ELLE Group #:** 1960331  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submittal Date/Time:** 06/28/2018 10:20  
**Collection Date/Time:** 06/27/2018 09:20

## Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07105	Volatile Headspace Hydrocarbon	RSKSOP-175 modified	1	181800002A	07/03/2018 03:43	Johanna C Kennedy	10
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	181800023A	07/06/2018 05:48	Amy Lehr	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	181800023A	07/02/2018 08:00	Joshua S Ruth	1
06037	Manganese	EPA 200.8 rev 5.4	1	181800705001A	07/16/2018 08:24	Choon Y Tian	5
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	181800705001	07/01/2018 23:31	Denise L Trimby	1
00368	Nitrate Nitrogen	EPA 300.0	1	18179249106A	06/29/2018 02:28	Zachary W Enck	5
00228	Sulfate	EPA 300.0	1	18179249106A	07/03/2018 07:52	Zachary W Enck	100

**Sample Description:** MW-526-W-180627 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9681594  
**ELLE Group #:** 1960331  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 06/28/2018 10:20  
**Collection Date/Time:** 06/27/2018 09:00

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270C SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14243	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14243	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14243	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14243	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14243	Chrysene	218-01-9	N.D.	0.01	1
14243	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14243	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	1,000	50	1
<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1
<b>GC Miscellaneous</b>		<b>RSKSOP-175 modified</b>	<b>ug/l</b>	<b>ug/l</b>	
07105	Methane	74-82-8	110	3.0	1
<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	48	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	110	1
<b>Trial ID: RE</b>					
12917	DX DRO C12-C24 w/ SiGel	n.a.	53	46	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1
The recovery for the sample surrogate(s) is outside the QC acceptance limits as noted on the QC Summary. The following action was taken: The sample was re-extracted within the method required holding time and the sample surrogate(s) is compliant. The recovery for a target analyte(s) in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary in trial 2. Both trials are reported.					
<b>Metals Dissolved</b>		<b>EPA 200.8 rev 5.4</b>	<b>ug/l</b>	<b>ug/l</b>	
06037	Manganese	7439-96-5	557	4.9	1
<b>Wet Chemistry</b>		<b>EPA 300.0</b>	<b>ug/l</b>	<b>ug/l</b>	
00368	Nitrate Nitrogen	14797-55-8	N.D.	250	5
00228	Sulfate	14808-79-8	69,000	1,500	5

## Sample Comments

State of Washington Lab Certification No. C457  
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

**Sample Description:** MW-526-W-180627 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9681594  
**ELLE Group #:** 1960331  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 06/28/2018 10:20

**Collection Date/Time:** 06/27/2018 09:00

## Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14243	SIM SVOAs 8270C MINI	SW-846 8270C SIM	1	18183WAO026	07/05/2018 23:38	Brandon K Cordova	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18183WAO026	07/03/2018 10:00	Joshua S Ruth	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18179B94A	07/01/2018 18:38	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18179B94A	07/01/2018 18:38	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18179B94A	07/01/2018 18:38	Jeremy C Giffin	1
07105	Volatile Headspace Hydrocarbon	RSKSOP-175 modified	1	181800002A	06/29/2018 15:04	Johanna C Kennedy	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	181800023A	07/06/2018 06:12	Amy Lehr	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	2-RE	181900002A	07/13/2018 11:47	Amy Lehr	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx	1	181800023A	07/02/2018 08:00	Joshua S Ruth	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx	2	181900002A	07/09/2018 18:14	Kate E Lutte	1
06037	Manganese	EPA 200.8 rev 5.4	1	181800705001A	07/12/2018 20:59	Bradley M Berlot	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	181800705001	07/01/2018 23:31	Denise L Trimby	1
00368	Nitrate Nitrogen	EPA 300.0	1	18179249106A	06/29/2018 01:35	Zachary W Enck	5
00228	Sulfate	EPA 300.0	1	18179249106A	06/29/2018 01:35	Zachary W Enck	5

**Sample Description:** MW-530-W-180627 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9681595  
**ELLE Group #:** 1960331  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 06/28/2018 10:20  
**Collection Date/Time:** 06/27/2018 11:55

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270C SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14243	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14243	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14243	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14243	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14243	Chrysene	218-01-9	N.D.	0.01	1
14243	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14243	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
The recovery for the sample surrogate(s) is outside the QC acceptance limits as noted on the QC Summary. The following action was taken: The sample was re-extracted outside the method required holding time and the QC is compliant. All results are reported from the first trial.					
<b>GC Volatiles</b>		<b>ECY 97-602 NWT PH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWT PH-Gx water C7-C12	n.a.	N.D.	50	1
<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1
<b>GC Miscellaneous</b>		<b>RSKSOP-175 modified</b>	<b>ug/l</b>	<b>ug/l</b>	
07105	Methane	74-82-8	61	3.0	1
<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWT PH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	46	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1
<b>Metals Dissolved</b>		<b>EPA 200.8 rev 5.4</b>	<b>ug/l</b>	<b>ug/l</b>	
06037	Manganese	7439-96-5	87.1	4.9	1
<b>Wet Chemistry</b>		<b>EPA 300.0</b>	<b>ug/l</b>	<b>ug/l</b>	
00368	Nitrate Nitrogen	14797-55-8	N.D.	250	5
00228	Sulfate	14808-79-8	769,000	150,000	500

### Sample Comments

State of Washington Lab Certification No. C457  
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14243	SIM SVOAs 8270C MINI	SW-846 8270C SIM	1	18183WAO026	07/06/2018 00:06	Brandon K Cordova	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18183WAO026	07/03/2018 10:00	Joshua S Ruth	1

**Sample Description:** MW-530-W-180627 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9681595  
**ELLE Group #:** 1960331  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submittal Date/Time:** 06/28/2018 10:20

**Collection Date/Time:** 06/27/2018 11:55

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18179B94A	07/01/2018 19:04	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18179B94A	07/01/2018 19:04	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18179B94A	07/01/2018 19:04	Jeremy C Giffin	1
07105	Volatile Headspace Hydrocarbon	RSKSOP-175 modified	1	181800003A	06/29/2018 16:22	Johanna C Kennedy	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	181800023A	07/06/2018 06:35	Amy Lehr	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	181800023A	07/02/2018 08:00	Joshua S Ruth	1
06037	Manganese	EPA 200.8 rev 5.4	1	181800705001A	07/12/2018 21:00	Bradley M Berlot	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	181800705001	07/01/2018 23:31	Denise L Trimby	1
00368	Nitrate Nitrogen	EPA 300.0	1	18179249106A	06/29/2018 07:30	Zachary W Enck	5
00228	Sulfate	EPA 300.0	1	18179249106A	06/30/2018 07:28	Zachary W Enck	500

**Sample Description:** MW-531-W-180627 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9681596  
**ELLE Group #:** 1960331  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 06/28/2018 10:20  
**Collection Date/Time:** 06/27/2018 09:30

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>					
<b>SW-846 8270C SIM</b>			<b>ug/l</b>	<b>ug/l</b>	
14243	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14243	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14243	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14243	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14243	Chrysene	218-01-9	N.D.	0.01	1
14243	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14243	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>					
<b>ECY 97-602 NWTPH-Gx</b>			<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	50	1
<b>GC Volatiles</b>					
<b>SW-846 8021B</b>			<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1
<b>GC Miscellaneous</b>					
<b>RSKSOP-175 modified</b>			<b>ug/l</b>	<b>ug/l</b>	
07105	Methane	74-82-8	86	3.0	1
<b>GC Petroleum Hydrocarbons w/Si</b>					
<b>ECY 97-602 NWTPH-Dx modified</b>			<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	46	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1
<b>Metals Dissolved</b>					
<b>EPA 200.8 rev 5.4</b>			<b>ug/l</b>	<b>ug/l</b>	
06037	Manganese	7439-96-5	312	4.9	1
<b>Wet Chemistry</b>					
<b>EPA 300.0</b>			<b>ug/l</b>	<b>ug/l</b>	
00368	Nitrate Nitrogen	14797-55-8	520	250	5
00228	Sulfate	14808-79-8	47,500	1,500	5

### Sample Comments

State of Washington Lab Certification No. C457  
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14243	SIM SVOAs 8270C MINI	SW-846 8270C SIM	1	18183WAO026	07/06/2018 00:34	Brandon K Cordova	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18183WAO026	07/03/2018 10:00	Joshua S Ruth	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18179B94A	07/01/2018 19:30	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18179B94A	07/01/2018 19:30	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18179B94A	07/01/2018 19:30	Jeremy C Giffin	1



**Sample Description:** MW-531-W-180627 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9681596  
**ELLE Group #:** 1960331  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submittal Date/Time:** 06/28/2018 10:20

**Collection Date/Time:** 06/27/2018 09:30

## Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07105	Volatile Headspace Hydrocarbon	RSKSOP-175 modified	1	181800003A	06/29/2018 16:38	Johanna C Kennedy	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	181800023A	07/06/2018 06:58	Amy Lehr	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	181800023A	07/02/2018 08:00	Joshua S Ruth	1
06037	Manganese	EPA 200.8 rev 5.4	1	181800705001A	07/12/2018 21:02	Bradley M Berlot	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	181800705001	07/01/2018 23:31	Denise L Trimby	1
00368	Nitrate Nitrogen	EPA 300.0	1	18179249106A	06/29/2018 02:46	Zachary W Enck	5
00228	Sulfate	EPA 300.0	1	18179249106A	06/29/2018 02:46	Zachary W Enck	5

**Sample Description:** MW-532-W-180627 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9681597  
**ELLE Group #:** 1960331  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 06/28/2018 10:20  
**Collection Date/Time:** 06/27/2018 09:45

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>					
<b>SW-846 8270C SIM</b>			<b>ug/l</b>	<b>ug/l</b>	
14243	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14243	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14243	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14243	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14243	Chrysene	218-01-9	N.D.	0.01	1
14243	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14243	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>					
<b>ECY 97-602 NWTPH-Gx</b>			<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	50	1
<b>GC Volatiles</b>					
<b>SW-846 8021B</b>			<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1
<b>GC Miscellaneous</b>					
<b>RSKSOP-175 modified</b>			<b>ug/l</b>	<b>ug/l</b>	
07105	Methane	74-82-8	360	3.0	1
<b>GC Petroleum Hydrocarbons w/Si</b>					
<b>ECY 97-602 NWTPH-Dx modified</b>			<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	46	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1
<b>Metals Dissolved</b>					
<b>EPA 200.8 rev 5.4</b>			<b>ug/l</b>	<b>ug/l</b>	
06037	Manganese	7439-96-5	460	4.9	1
<b>Wet Chemistry</b>					
<b>EPA 300.0</b>			<b>ug/l</b>	<b>ug/l</b>	
00368	Nitrate Nitrogen	14797-55-8	N.D.	250	5
00228	Sulfate	14808-79-8	159,000	15,000	50

### Sample Comments

State of Washington Lab Certification No. C457  
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14243	SIM SVOAs 8270C MINI	SW-846 8270C SIM	1	18183WAO026	07/06/2018 01:02	Brandon K Cordova	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18183WAO026	07/03/2018 10:00	Joshua S Ruth	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18179B94A	07/01/2018 21:09	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18179B94A	07/01/2018 21:09	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18179B94A	07/01/2018 21:09	Jeremy C Giffin	1

**Sample Description:** MW-532-W-180627 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9681597  
**ELLE Group #:** 1960331  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submittal Date/Time:** 06/28/2018 10:20

**Collection Date/Time:** 06/27/2018 09:45

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07105	Volatile Headspace Hydrocarbon	RSKSOP-175 modified	1	181800003A	06/29/2018 16:53	Johanna C Kennedy	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	181800023A	07/06/2018 07:21	Amy Lehr	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	181800023A	07/02/2018 08:00	Joshua S Ruth	1
06037	Manganese	EPA 200.8 rev 5.4	1	181800705001A	07/12/2018 21:04	Bradley M Berlot	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	181800705001	07/01/2018 23:31	Denise L Trimby	1
00368	Nitrate Nitrogen	EPA 300.0	1	18179249106A	06/29/2018 03:21	Zachary W Enck	5
00228	Sulfate	EPA 300.0	1	18179249106A	06/30/2018 08:03	Zachary W Enck	50

**Sample Description:** MW-533-W-180627 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9681598  
**ELLE Group #:** 1960331  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 06/28/2018 10:20  
**Collection Date/Time:** 06/27/2018 10:00

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>					
<b>SW-846 8270C SIM</b>			<b>ug/l</b>	<b>ug/l</b>	
14243	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14243	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14243	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14243	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14243	Chrysene	218-01-9	N.D.	0.01	1
14243	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14243	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>					
<b>ECY 97-602 NWTPH-Gx</b>			<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	50	1
<b>GC Volatiles</b>					
<b>SW-846 8021B</b>			<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1
<b>GC Miscellaneous</b>					
<b>RSKSOP-175 modified</b>			<b>ug/l</b>	<b>ug/l</b>	
07105	Methane	74-82-8	5.8	3.0	1
<b>GC Petroleum Hydrocarbons w/Si</b>					
<b>ECY 97-602 NWTPH-Dx modified</b>			<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	45	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1
<b>Metals Dissolved</b>					
<b>EPA 200.8 rev 5.4</b>			<b>ug/l</b>	<b>ug/l</b>	
06037	Manganese	7439-96-5	35.0	4.9	1
<b>Wet Chemistry</b>					
<b>EPA 300.0</b>			<b>ug/l</b>	<b>ug/l</b>	
00368	Nitrate Nitrogen	14797-55-8	N.D.	250	5
00228	Sulfate	14808-79-8	30,500	1,500	5

### Sample Comments

State of Washington Lab Certification No. C457  
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14243	SIM SVOAs 8270C MINI	SW-846 8270C SIM	1	18183WAO026	07/06/2018 01:29	Brandon K Cordova	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18183WAO026	07/03/2018 10:00	Joshua S Ruth	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18179B94A	07/01/2018 21:35	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18179B94A	07/01/2018 21:35	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18179B94A	07/01/2018 21:35	Jeremy C Giffin	1

**Sample Description:** MW-533-W-180627 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9681598  
**ELLE Group #:** 1960331  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submittal Date/Time:** 06/28/2018 10:20  
**Collection Date/Time:** 06/27/2018 10:00

## Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07105	Volatile Headspace Hydrocarbon	RSKSOP-175 modified	1	181800003A	06/29/2018 17:14	Johanna C Kennedy	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	181900041A	07/13/2018 17:10	Amy Lehr	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	2	181900041A	07/10/2018 08:00	Kayla A Yuditsky	1
06037	Manganese	EPA 200.8 rev 5.4	1	181800705003A	07/12/2018 08:15	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	181800705003	07/01/2018 23:31	Denise L Trimby	1
00368	Nitrate Nitrogen	EPA 300.0	1	18179249106B	06/29/2018 03:39	Zachary W Enck	5
00228	Sulfate	EPA 300.0	1	18179249106B	06/29/2018 03:39	Zachary W Enck	5

**Sample Description:** MW-534-W-180627 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9681599  
**ELLE Group #:** 1960331  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 06/28/2018 10:20  
**Collection Date/Time:** 06/27/2018 13:10

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>					
<b>SW-846 8270C SIM</b>			<b>ug/l</b>	<b>ug/l</b>	
14243	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14243	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14243	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14243	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14243	Chrysene	218-01-9	N.D.	0.01	1
14243	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14243	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>					
<b>ECY 97-602 NWTPH-Gx</b>			<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	50	1
<b>GC Volatiles</b>					
<b>SW-846 8021B</b>			<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1
<b>GC Miscellaneous</b>					
<b>RSKSOP-175 modified</b>			<b>ug/l</b>	<b>ug/l</b>	
07105	Methane	74-82-8	5,500	60	20
<b>GC Petroleum Hydrocarbons w/Si</b>					
<b>ECY 97-602 NWTPH-Dx modified</b>			<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	46	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1
<b>Metals Dissolved</b>					
<b>EPA 200.8 rev 5.4</b>			<b>ug/l</b>	<b>ug/l</b>	
06037	Manganese	7439-96-5	3,760	24.4	5
<b>Wet Chemistry</b>					
<b>EPA 300.0</b>			<b>ug/l</b>	<b>ug/l</b>	
00368	Nitrate Nitrogen	14797-55-8	N.D.	250	5
00228	Sulfate	14808-79-8	41,300	1,500	5

### Sample Comments

State of Washington Lab Certification No. C457  
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14243	SIM SVOAs 8270C MINI	SW-846 8270C SIM	1	18183WAO026	07/06/2018 01:57	Brandon K Cordova	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18183WAO026	07/03/2018 10:00	Joshua S Ruth	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18179B94A	07/01/2018 22:00	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18179B94A	07/01/2018 22:00	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18179B94A	07/01/2018 22:00	Jeremy C Giffin	1

**Sample Description:** MW-534-W-180627 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9681599  
**ELLE Group #:** 1960331  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submittal Date/Time:** 06/28/2018 10:20

**Collection Date/Time:** 06/27/2018 13:10

## Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07105	Volatile Headspace Hydrocarbon	RSKSOP-175 modified	1	181800003A	07/03/2018 04:17	Johanna C Kennedy	20
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	181800024A	07/06/2018 10:03	Amy Lehr	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	181800024A	07/02/2018 08:00	Kayla A Yuditsky	1
06037	Manganese	EPA 200.8 rev 5.4	1	181800705003A	07/16/2018 16:03	Bradley M Berlot	5
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	181800705003	07/01/2018 23:31	Denise L Trimby	1
00368	Nitrate Nitrogen	EPA 300.0	1	18179249306A	06/29/2018 11:03	Zachary W Enck	5
00228	Sulfate	EPA 300.0	1	18179249306A	06/29/2018 11:03	Zachary W Enck	5

**Sample Description:** MW-535-W-180627 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9681600  
**ELLE Group #:** 1960331  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 06/28/2018 10:20  
**Collection Date/Time:** 06/27/2018 11:15

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>					
<b>SW-846 8270C SIM</b>			<b>ug/l</b>	<b>ug/l</b>	
14243	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14243	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14243	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14243	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14243	Chrysene	218-01-9	N.D.	0.01	1
14243	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14243	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>					
<b>ECY 97-602 NWTPH-Gx</b>			<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	50	1
<b>GC Volatiles</b>					
<b>SW-846 8021B</b>			<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1
<b>GC Miscellaneous</b>					
<b>RSKSOP-175 modified</b>			<b>ug/l</b>	<b>ug/l</b>	
07105	Methane	74-82-8	8.0	3.0	1
<b>GC Petroleum Hydrocarbons w/Si</b>					
<b>ECY 97-602 NWTPH-Dx modified</b>			<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	48	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	110	1
<b>Metals Dissolved</b>					
<b>EPA 200.8 rev 5.4</b>			<b>ug/l</b>	<b>ug/l</b>	
06037	Manganese	7439-96-5	44.3	4.9	1
<b>Wet Chemistry</b>					
<b>EPA 300.0</b>			<b>ug/l</b>	<b>ug/l</b>	
00368	Nitrate Nitrogen	14797-55-8	N.D.	250	5
00228	Sulfate	14808-79-8	29,600	1,500	5

### Sample Comments

State of Washington Lab Certification No. C457  
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14243	SIM SVOAs 8270C MINI	SW-846 8270C SIM	1	18183WAO026	07/06/2018 02:25	Brandon K Cordova	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18183WAO026	07/03/2018 10:00	Joshua S Ruth	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18179B94A	07/01/2018 22:25	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18179B94A	07/01/2018 22:25	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18179B94A	07/01/2018 22:25	Jeremy C Giffin	1



**Sample Description:** MW-535-W-180627 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9681600  
**ELLE Group #:** 1960331  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submittal Date/Time:** 06/28/2018 10:20  
**Collection Date/Time:** 06/27/2018 11:15

## Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07105	Volatile Headspace Hydrocarbon	RSKSOP-175 modified	1	181800003A	06/29/2018 17:48	Johanna C Kennedy	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	181800024A	07/06/2018 10:26	Amy Lehr	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	181800024A	07/02/2018 08:00	Kayla A Yuditsky	1
06037	Manganese	EPA 200.8 rev 5.4	1	181800705003A	07/12/2018 08:17	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	181800705003	07/01/2018 23:31	Denise L Trimby	1
00368	Nitrate Nitrogen	EPA 300.0	1	18179249106B	06/29/2018 06:54	Zachary W Enck	5
00228	Sulfate	EPA 300.0	1	18179249106B	06/29/2018 06:54	Zachary W Enck	5

**Sample Description:** MW-502-W-180627 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9681601  
**ELLE Group #:** 1960331  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 06/28/2018 10:20

**Collection Date/Time:** 06/27/2018 15:00

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>					
		<b>SW-846 8270C SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14243	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14243	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14243	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14243	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14243	Chrysene	218-01-9	N.D.	0.01	1
14243	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14243	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>					
		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	50	1
<b>GC Volatiles</b>					
		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1
<b>GC Miscellaneous</b>					
		<b>RSKSOP-175 modified</b>	<b>ug/l</b>	<b>ug/l</b>	
07105	Methane	74-82-8	5.2	3.0	1
<b>GC Petroleum Hydrocarbons w/Si</b>					
		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	50	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	110	1
<b>Metals Dissolved</b>					
		<b>EPA 200.8 rev 5.4</b>	<b>ug/l</b>	<b>ug/l</b>	
06037	Manganese	7439-96-5	247	4.9	1
<b>Wet Chemistry</b>					
		<b>EPA 300.0</b>	<b>ug/l</b>	<b>ug/l</b>	
00368	Nitrate Nitrogen	14797-55-8	N.D.	250	5
00228	Sulfate	14808-79-8	23,000	1,500	5

### Sample Comments

State of Washington Lab Certification No. C457  
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14243	SIM SVOAs 8270C MINI	SW-846 8270C SIM	1	18183WAO026	07/06/2018 02:52	Brandon K Cordova	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18183WAO026	07/03/2018 10:00	Joshua S Ruth	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18179B94A	07/01/2018 22:51	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18179B94A	07/01/2018 22:51	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18179B94A	07/01/2018 22:51	Jeremy C Giffin	1

**Sample Description:** MW-502-W-180627 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9681601  
**ELLE Group #:** 1960331  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submittal Date/Time:** 06/28/2018 10:20  
**Collection Date/Time:** 06/27/2018 15:00

## Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07105	Volatile Headspace Hydrocarbon	RSKSOP-175 modified	1	181800003A	06/29/2018 18:28	Johanna C Kennedy	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	181800024A	07/06/2018 10:49	Amy Lehr	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	181800024A	07/02/2018 08:00	Kayla A Yuditsky	1
06037	Manganese	EPA 200.8 rev 5.4	1	181800705003A	07/12/2018 08:19	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	181800705003	07/01/2018 23:31	Denise L Trimby	1
00368	Nitrate Nitrogen	EPA 300.0	1	18179249306A	06/29/2018 11:21	Zachary W Enck	5
00228	Sulfate	EPA 300.0	1	18179249306A	06/29/2018 11:21	Zachary W Enck	5

**Sample Description:** MW-519-W-180627 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9681602  
**ELLE Group #:** 1960331  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 06/28/2018 10:20

**Collection Date/Time:** 06/27/2018 14:20

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>					
		<b>SW-846 8270C SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14243	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14243	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14243	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14243	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14243	Chrysene	218-01-9	N.D.	0.01	1
14243	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14243	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>					
		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	50	1
<b>GC Volatiles</b>					
		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1
<b>GC Miscellaneous</b>					
		<b>RSKSOP-175 modified</b>	<b>ug/l</b>	<b>ug/l</b>	
07105	Methane	74-82-8	72	3.0	1
<b>GC Petroleum Hydrocarbons w/Si</b>					
		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	46	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1
<b>Metals Dissolved</b>					
		<b>EPA 200.8 rev 5.4</b>	<b>ug/l</b>	<b>ug/l</b>	
06037	Manganese	7439-96-5	586	4.9	1
<b>Wet Chemistry</b>					
		<b>EPA 300.0</b>	<b>ug/l</b>	<b>ug/l</b>	
00368	Nitrate Nitrogen	14797-55-8	N.D.	250	5
00228	Sulfate	14808-79-8	39,200	1,500	5

### Sample Comments

State of Washington Lab Certification No. C457  
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14243	SIM SVOAs 8270C MINI	SW-846 8270C SIM	1	18183WAO026	07/06/2018 03:20	Brandon K Cordova	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18183WAO026	07/03/2018 10:00	Joshua S Ruth	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18179B94A	07/01/2018 23:17	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18179B94A	07/01/2018 23:17	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18179B94A	07/01/2018 23:17	Jeremy C Giffin	1

**Sample Description:** MW-519-W-180627 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9681602  
**ELLE Group #:** 1960331  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submittal Date/Time:** 06/28/2018 10:20

**Collection Date/Time:** 06/27/2018 14:20

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07105	Volatile Headspace Hydrocarbon	RSKSOP-175 modified	1	181800003A	06/29/2018 18:43	Johanna C Kennedy	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	181800024A	07/06/2018 11:12	Amy Lehr	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	181800024A	07/02/2018 08:00	Kayla A Yuditsky	1
06037	Manganese	EPA 200.8 rev 5.4	1	181800705003A	07/12/2018 08:24	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	181800705003	07/01/2018 23:31	Denise L Trimby	1
00368	Nitrate Nitrogen	EPA 300.0	1	18179249306A	06/29/2018 11:38	Zachary W Enck	5
00228	Sulfate	EPA 300.0	1	18179249306A	06/29/2018 11:38	Zachary W Enck	5

**Sample Description:** DUP-1-WD-180627 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9681603  
**ELLE Group #:** 1960331  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 06/28/2018 10:20  
**Collection Date/Time:** 06/27/2018

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>					
		<b>SW-846 8270C SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14243	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14243	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14243	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14243	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14243	Chrysene	218-01-9	N.D.	0.01	1
14243	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14243	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>					
		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	50	1
<b>GC Volatiles</b>					
		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1
<b>GC Miscellaneous</b>					
		<b>RSKSOP-175 modified</b>	<b>ug/l</b>	<b>ug/l</b>	
07105	Methane	74-82-8	5.6	3.0	1
<b>GC Petroleum Hydrocarbons w/Si</b>					
		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	49	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	110	1
<b>Metals Dissolved</b>					
		<b>EPA 200.8 rev 5.4</b>	<b>ug/l</b>	<b>ug/l</b>	
06037	Manganese	7439-96-5	48.4	4.9	1
<b>Wet Chemistry</b>					
		<b>EPA 300.0</b>	<b>ug/l</b>	<b>ug/l</b>	
00368	Nitrate Nitrogen	14797-55-8	N.D.	250	5
00228	Sulfate	14808-79-8	21,900	1,500	5

### Sample Comments

State of Washington Lab Certification No. C457  
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14243	SIM SVOAs 8270C MINI	SW-846 8270C SIM	1	18183WAO026	07/06/2018 03:48	Brandon K Cordova	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18183WAO026	07/03/2018 10:00	Joshua S Ruth	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18179B94A	07/01/2018 23:43	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18179B94A	07/01/2018 23:43	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18179B94A	07/01/2018 23:43	Jeremy C Giffin	1

**Sample Description:** DUP-1-WD-180627 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9681603  
**ELLE Group #:** 1960331  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submittal Date/Time:** 06/28/2018 10:20  
**Collection Date/Time:** 06/27/2018

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07105	Volatile Headspace Hydrocarbon	RSKSOP-175 modified	1	181800003A	06/29/2018 19:00	Johanna C Kennedy	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	181900041A	07/13/2018 17:33	Amy Lehr	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	2	181900041A	07/10/2018 08:00	Kayla A Yuditsky	1
06037	Manganese	EPA 200.8 rev 5.4	1	181800705003A	07/12/2018 08:26	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	181800705003	07/01/2018 23:31	Denise L Trimby	1
00368	Nitrate Nitrogen	EPA 300.0	1	18179249106B	06/28/2018 22:55	Zachary W Enck	5
00228	Sulfate	EPA 300.0	1	18179249106B	06/28/2018 22:55	Zachary W Enck	5

**Sample Description:** Trip\_Blank-T-180627 NA Water  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

Chevron Environmental Mgmt Co  
ELLE Sample #: WW 9681604  
ELLE Group #: 1960331  
Matrix: Water

**Project Name:** Edmonds Terminal

Submittal Date/Time: 06/28/2018 10:20  
Collection Date/Time: 06/27/2018

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC Volatiles</b>					
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx n.a.	ug/l N.D.	ug/l 50	1
<b>GC Volatiles</b>					
02102	Benzene	SW-846 8021B 71-43-2	ug/l N.D.	ug/l 0.5	1

### Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18179B94A	07/01/2018 16:05	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18179B94A	07/01/2018 16:05	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18179B94A	07/01/2018 16:05	Jeremy C Giffin	1



## Quality Control Summary

Client Name: Chevron Environmental Mgmt Co  
Reported: 07/19/2018 12:14

Group Number: 1960331

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

### Method Blank

Analysis Name	Result ug/l	MDL ug/l
Batch number: 18183WAO026	Sample number(s): 9681588-9681603	
Benzo(a)anthracene	0.01	0.01
Benzo(a)pyrene	0.01	0.01
Benzo(b)fluoranthene	0.01	0.01
Benzo(k)fluoranthene	0.01	0.01
Chrysene	0.01	0.01
Dibenz(a,h)anthracene	N.D.	0.02
Indeno(1,2,3-cd)pyrene	0.01	0.01
Batch number: 18179B94A	Sample number(s): 9681589-9681604	
Benzene	N.D.	0.2
NWTPH-Gx water C7-C12	N.D.	50
Batch number: 18186A94A	Sample number(s): 9681588	
Benzene	N.D.	0.2
NWTPH-Gx water C7-C12	N.D.	50
Batch number: 181800002A	Sample number(s): 9681588-9681594	
Methane	N.D.	3.0
Batch number: 181800003A	Sample number(s): 9681595-9681603	
Methane	N.D.	3.0
Batch number: 181800023A	Sample number(s): 9681588-9681597	
DX DRO C12-C24 w/ SiGel	N.D.	45
DX HRO C24-C40 w/ SiGel	N.D.	100
Batch number: 181800024A	Sample number(s): 9681599-9681602	
DX DRO C12-C24 w/ SiGel	N.D.	45
DX HRO C24-C40 w/ SiGel	N.D.	100
Batch number: 181900002A	Sample number(s): 9681594	
DX DRO C12-C24 w/ SiGel	N.D.	45
DX HRO C24-C40 w/ SiGel	N.D.	100
Batch number: 181900041A	Sample number(s): 9681598,9681603	
DX DRO C12-C24 w/ SiGel	N.D.	45
DX HRO C24-C40 w/ SiGel	N.D.	100
Batch number: 181800705001A	Sample number(s): 9681588-9681597	
Manganese	N.D.	4.9
Batch number: 181800705003A	Sample number(s): 9681598-9681603	
Manganese	N.D.	4.9

\*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

## Quality Control Summary

Client Name: Chevron Environmental Mgmt Co  
Reported: 07/19/2018 12:14

Group Number: 1960331

### Method Blank (continued)

Analysis Name	Result ug/l	MDL ug/l
Batch number: 18179249106A	Sample number(s): 9681588-9681597	
Nitrate Nitrogen	N.D.	50
Sulfate	N.D.	300
Batch number: 18179249106B	Sample number(s): 9681598,9681600,9681603	
Nitrate Nitrogen	N.D.	50
Sulfate	N.D.	300
Batch number: 18179249306A	Sample number(s): 9681599,9681601-9681602	
Nitrate Nitrogen	N.D.	50
Sulfate	N.D.	300

### LCS/LCSD

Analysis Name	LCS Spike Added ug/l	LCS Conc ug/l	LCSD Spike Added ug/l	LCSD Conc ug/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: 18183WAO026	Sample number(s): 9681588-9681603								
Benzo(a)anthracene	1.00	0.855	1.00	0.702	86	70	65-129	20	30
Benzo(a)pyrene	1.00	0.918	1.00	0.743	92	74	65-126	21	30
Benzo(b)fluoranthene	1.00	0.967	1.00	0.813	97	81	65-136	17	30
Benzo(k)fluoranthene	1.00	0.889	1.00	0.750	89	75	65-131	17	30
Chrysene	1.00	0.865	1.00	0.720	86	72	62-129	18	30
Dibenz(a,h)anthracene	1.00	0.873	1.00	0.766	87	77	50-139	13	30
Indeno(1,2,3-cd)pyrene	1.00	0.935	1.00	0.769	94	77	52-133	20	30
	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>					
Batch number: 18179B94A	Sample number(s): 9681589-9681604								
Benzene	20	20.79	20	20.64	104	103	80-120	1	30
NWTPH-Gx water C7-C12	1100	1287.09	1100	1302.95	117	118	80-120	1	30
Batch number: 18186A94A	Sample number(s): 9681588								
Benzene	20	20.53			103		80-120		
NWTPH-Gx water C7-C12	1100	1313.49			119		80-120		
	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>					
Batch number: 181800002A	Sample number(s): 9681588-9681594								
Methane	59.8	63.64	59.8	62.68	106	105	85-115	2	20
Batch number: 181800003A	Sample number(s): 9681595-9681603								
Methane	59.8	60.93	59.8	62.38	102	104	85-115	2	20
	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>					

\*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

## Quality Control Summary

Client Name: Chevron Environmental Mgmt Co  
Reported: 07/19/2018 12:14

Group Number: 1960331

### LCS/LCSD (continued)

Analysis Name	LCS Spike Added ug/l	LCS Conc ug/l	LCSD Spike Added ug/l	LCSD Conc ug/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: 181800023A DX DRO C12-C24 w/ SiGel	600	185.43	600	197.28	31	33	30-115	6	20
Batch number: 181800024A DX DRO C12-C24 w/ SiGel	600	202.46	600	206.77	34	34	30-115	2	20
Batch number: 181900002A DX DRO C12-C24 w/ SiGel	600	176.83	600	134.24	29*	22*	30-115	27*	20
Batch number: 181900041A DX DRO C12-C24 w/ SiGel	600	181.19	600	182.32	30	30	30-115	1	20
Batch number: 181800705001A Manganese	50	52.51			105		85-115		
Batch number: 181800705003A Manganese	50	50.95			102		85-115		
Batch number: 18179249106A Nitrate Nitrogen Sulfate	750 7500	723.88 7505.71			97 100		90-110 90-110		
Batch number: 18179249106B Nitrate Nitrogen Sulfate	750 7500	723.88 7505.71			97 100		90-110 90-110		
Batch number: 18179249306A Nitrate Nitrogen Sulfate	750 7500	702.42 7547.53			94 101		90-110 90-110		

### MS/MSD

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc ug/l	MS Spike Added ug/l	MS Conc ug/l	MSD Spike Added ug/l	MSD Conc ug/l	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Batch number: 181800705001A Manganese	56.06	50	104.98			98		70-130		
Batch number: 181800705003A Manganese	3760.92	50	3870.93			220 (2)		70-130		

\*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

## Quality Control Summary

Client Name: Chevron Environmental Mgmt Co  
Reported: 07/19/2018 12:14

Group Number: 1960331

### MS/MSD (continued)

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc ug/l	MS Spike Added ug/l	MS Conc ug/l	MSD Spike Added ug/l	MSD Conc ug/l	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Batch number: 18179249106A										
Nitrate Nitrogen	N.D.	2500	2670.45			107		90-110		
Sulfate	12963.69	25000	41793.07			115*		90-110		

### Laboratory Duplicate

Background (BKG) = the sample used in conjunction with the duplicate

Analysis Name	BKG Conc ug/l	DUP Conc ug/l	DUP RPD	DUP RPD Max
Batch number: 181800705001A				
Manganese	56.06	52.02	7	20
Batch number: 181800705003A				
Manganese	3760.92	3804.41	1	20
Batch number: 18179249106A				
Nitrate Nitrogen	N.D.	N.D.	0 (1)	15
Sulfate	12963.69	14124.32	9 (1)	15

### Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: SIM SVOAs 8270C MINI

Batch number: 18183WAO026

	Fluoranthene-d10	Benzo(a)pyrene-d12	1-Methylnaphthalene-d10
9681588	52	27	52
9681589	69	42	65
9681590	67	68	71
9681591	55	69	66
9681592	67	63	66
9681593	71	67	71
9681594	57	50	103

\*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

## Quality Control Summary

Client Name: Chevron Environmental Mgmt Co  
Reported: 07/19/2018 12:14

Group Number: 1960331

### Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: SIM SVOAs 8270C MINI

Batch number: 18183WAO026

	Fluoranthene-d10	Benzo(a)pyrene-d12	1-Methylnaphthalene-d10
9681595	38*	35	32
9681596	63	41	53
9681597	61	42	64
9681598	69	55	66
9681599	71	61	68
9681600	69	66	67
9681601	68	48	64
9681602	67	43	59
9681603	61	58	57
Blank	75	77	71
LCS	69	74	61
LCSD	66	72	60

Limits: 43-130 23-144 31-121

Analysis Name: Method 8021 Water Master

Batch number: 18179B94A

	Trifluorotoluene-P	Trifluorotoluene-F
9681589	82	79
9681590	84	80
9681591	81	80
9681592	83	80
9681593	91	96
9681594	81	80
9681595	82	80
9681596	82	80
9681597	83	80
9681598	83	80
9681599	83	80
9681600	83	80
9681601	83	80
9681602	83	80
9681603	82	81
9681604	83	81
Blank	83	80
LCS	81	94
LCSD	81	95

Limits: 51-120 50-150

Analysis Name: Method 8021 Water Master

Batch number: 18186A94A

\*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

## Quality Control Summary

Client Name: Chevron Environmental Mgmt Co  
Reported: 07/19/2018 12:14

Group Number: 1960331

### Surrogate Quality Control (continued)

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: Method 8021 Water Master  
Batch number: 18186A94A

	Trifluorotoluene-P	Trifluorotoluene-F
9681588	84	79
Blank	83	84
LCS	82	97
Limits:	51-120	50-150

Analysis Name: Volatile Headspace Hydrocarbon  
Batch number: 181800002A

	Propene
9681588	80
9681589	90
9681590	87
9681591	88
9681592	76
9681593	86
9681594	84
Blank	92
LCS	95
LCSD	97
Limits:	57-128

Analysis Name: Volatile Headspace Hydrocarbon  
Batch number: 181800003A

	Propene
9681595	85
9681596	90
9681597	84
9681598	86
9681599	96
9681600	83
9681601	82
9681602	87
9681603	91
Blank	82
LCS	90
LCSD	97
Limits:	57-128

Analysis Name: NWTPH-Dx water w/Si Gel  
Batch number: 181800023A

\*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

## Quality Control Summary

Client Name: Chevron Environmental Mgmt Co  
Reported: 07/19/2018 12:14

Group Number: 1960331

### Surrogate Quality Control (continued)

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: NWTPH-Dx water w/Si Gel  
Batch number: 181800023A

	Orthoterphenyl	Capric Acid
9681588	43*	0
9681589	65	0
9681590	55	0
9681591	64	0
9681592	68	0
9681593	58	0
9681594	36*	0
9681595	61	0
9681596	66	0
9681597	67	0
Blank	65	0
LCS	53	0
LCSD	57	0

Limits: 50-150 0-1

Analysis Name: NWTPH-Dx water w/Si Gel  
Batch number: 181800024A

	Orthoterphenyl	Capric Acid
9681599	53	0
9681600	55	0
9681601	60	0
9681602	53	0
Blank	61	0
LCS	59	0
LCSD	60	0

Limits: 50-150 0-1

Analysis Name: NWTPH-Dx water w/Si Gel  
Batch number: 181900002A

	Orthoterphenyl	Capric Acid
9681594RE	54	0
Blank	62	0
LCS	60	0
LCSD	56	0

Limits: 50-150 0-1

Analysis Name: NWTPH-Dx water w/Si Gel  
Batch number: 181900041A

\*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

## Quality Control Summary

Client Name: Chevron Environmental Mgmt Co  
Reported: 07/19/2018 12:14

Group Number: 1960331

### Surrogate Quality Control (continued)

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: NWTPH-Dx water w/Si Gel

Batch number: 181900041A

	Orthoterphenyl	Capric Acid
9681598	50	0
9681603	50	0
Blank	69	0
LCS	62	0
LCSD	57	0
Limits:	50-150	0-1

\*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.



# Chevron Northwest Region Analysis Request/Chain of Custody



**Lancaster Laboratories**

Acct. # 11964

For Lancaster Laboratories use only  
 Group # 1960331 Sample # 9681588-604

Instructions on reverse side correspond with circled numbers.

1 Client Information			4 Matrix			5 Analyses Requested										6 Remarks											
Facility # <u>Edmonds Terminal</u> WBS <u>NWENVPM6001430802</u> Site Address <u>11720 UNOLO Rd, Edmonds, WA</u> Chevron PM <u>Kim Solitz</u> Lead Consultant <u>Arcadis</u> Consultant/Office <u>1100 Olive Way, Suite 800, Seattle, WA 98101</u> Consultant Project Mgr. <u>Scott Zorn</u> Consultant Phone # _____			Sediment <input type="checkbox"/> <input checked="" type="checkbox"/> Ground <input type="checkbox"/> Potable <input type="checkbox"/> NPDES <input type="checkbox"/> Surface <input type="checkbox"/> Oil <input type="checkbox"/> Air <input type="checkbox"/>			Total Number of Containers _____ BTEX-MTBE <input checked="" type="checkbox"/> 802 <input checked="" type="checkbox"/> 8260 <input type="checkbox"/> Naphth _____ 8260 full scan _____ Oxygenates _____ NWTPH GX _____ NWTPH DX <input type="checkbox"/> Silica Gel Cleanup <input checked="" type="checkbox"/> Lead <input type="checkbox"/> Total <input type="checkbox"/> Diss. <input type="checkbox"/> Method _____ WAVPH <input type="checkbox"/> WAEPH <input type="checkbox"/> CPAs by USEPA 8270C SIM _____ Sulfate, Nitrate by USEPA 300.0 _____ Dissolved Methane by USEPA RSK _____ Dissolved Manganese by USEPA 200.2 _____										SCR #: _____ <input type="checkbox"/> Results in Dry Weight <input type="checkbox"/> J value reporting needed <input type="checkbox"/> Must meet lowest detection limits possible for 8260 compounds <input type="checkbox"/> 8021 MTBE Confirmation <input type="checkbox"/> Confirm MTBE + Naphthalene <input type="checkbox"/> Confirm highest hit by 8260 <input type="checkbox"/> Confirm all hits by 8260 <input type="checkbox"/> Run _____ oxy's on highest hit <input type="checkbox"/> Run _____ oxy's on all hits											
Sampler <u>Eric Krueger, Jason Little, Patrick Collins, Alex Pink</u>			3 Grab <input checked="" type="checkbox"/> Composite <input type="checkbox"/>																								
2 Sample Identification			Collected													6 Remarks											
		Date	Time	Grab	Composite	Soil	Water	Oil	Total Number of Containers	BTEX-MTBE	802	8260	Naphth	Oxygenates	NWTPH GX	NWTPH DX	Silica Gel Cleanup	Lead	Total	Diss.	Method	WAVPH	WAEPH				
<u>LM-2</u>		<u>6/23/18</u>	<u>1150</u>	<input checked="" type="checkbox"/>																					* Standard Silica Gel cleanup * Dissolved manganese field filtered		
<u>MW-104</u>			<u>1055</u>																								
<u>MW-129R</u>			<u>1225</u>																								
<u>MW-E-12</u>			<u>1300</u>																								
<u>MW-511</u>			<u>1330</u>																								
<u>MW-525</u>			<u>0920</u>																								
<u>MW-526</u>			<u>0900</u>																								
<u>MW-530</u>			<u>1155</u>																								
<u>MW-531</u>			<u>0930</u>																								
<u>MW-532</u>			<u>0945</u>																								
<u>MW-533</u>			<u>1000</u>																								
<u>MW-534</u>			<u>1310</u>																								
<u>MW-535</u>			<u>1115</u>																								
7 Turnaround Time Requested (TAT) (please circle) Standard <input checked="" type="checkbox"/> 5 day      4 day 72 hour      48 hour      24 hour			Relinquished by <u>[Signature]</u> Date <u>6/27/18</u> Time <u>1530</u>			Received by _____ Date _____ Time _____			Relinquished by _____ Date _____ Time _____			Received by _____ Date _____ Time _____			9												
8 Data Package Options (please circle if required) Type I - Full <input checked="" type="checkbox"/> Type VI (Raw Data)			Relinquished by Commercial Carrier: UPS _____ FedEx <input checked="" type="checkbox"/> Other _____			Received by <u>Alix Gonzalez</u> Date <u>6/28/18</u> Time <u>10:20</u>			Temperature Upon Receipt _____ °C			Custody Seals Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No															

# Chevron Northwest Region Analysis Request/Chain of Custody



**Lancaster Laboratories**

Acct. # 11964    Group # 1960331    For Lancaster Laboratories use only Sample # 9681588-604  
Instructions on reverse side correspond with circled numbers.

<b>1 Client Information</b>			<b>4 Matrix</b>			<b>5 Analyses Requested</b>										<b>6 Remarks</b>	
Facility # <u>Edmonds Terminal</u> WBS <u>NWENVPML6001430802</u> Site Address <u>11720 unolo Rd, Edmonds, WA</u> Chevron PM <u>Kim Solitz</u> Lead Consultant <u>Arcadis</u> Consultant/Office <u>1100 olive way, suite 800, Seattle, WA 98101</u> Consultant Project Mgr. <u>Scott Zorn</u> Consultant Phone # _____			Sediment <input type="checkbox"/> Potable <input type="checkbox"/> Oil <input type="checkbox"/> Ground <input checked="" type="checkbox"/> NPDES <input type="checkbox"/> Air <input type="checkbox"/> Surface <input type="checkbox"/>			Total Number of Containers <u>802</u> BTEX <input checked="" type="checkbox"/> 8260 <input checked="" type="checkbox"/> Naphth <input type="checkbox"/> 8260 full scan _____ Oxygenates _____ NWTPH GX _____ NWTPH DX <input type="checkbox"/> Silica Gel Cleanup <input checked="" type="checkbox"/> Lead <input type="checkbox"/> Total <input type="checkbox"/> Diss. <input type="checkbox"/> Method _____ WAVPH <input type="checkbox"/> WAEPH <input type="checkbox"/> CPALS by USEPA 8270 SIM SUBSTATE, NAWATEC USEPA 300.0 DISSOLVED Manganese USEPA PSL 175 DISSOLVED Manganese USEPA 200.8										SCR #: _____ <input type="checkbox"/> Results in Dry Weight <input type="checkbox"/> J value reporting needed <input type="checkbox"/> Must meet lowest detection limits possible for 8260 compounds <input type="checkbox"/> 8021 MTBE Confirmation <input type="checkbox"/> Confirm MTBE + Naphthalene <input type="checkbox"/> Confirm highest hit by 8260 <input type="checkbox"/> Confirm all hits by 8260 <input type="checkbox"/> Run _____ oxy's on highest hit <input type="checkbox"/> Run _____ oxy's on all hits	
<b>2 Sample Identification</b>			<b>3</b>														
Collected Date   Time   Grab   Composite   Soil   Water   Oil   Total Number of Containers																	
MW-502    6/27/18    1500 <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>																* Standard silica gel cleanup * Dissolved manganese field filtered	
MW-519    ↓    1420 <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>																	
DUP-1    ↓    — <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>																	
Trip Blank    —    — <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>																	
<b>7 Turnaround Time Requested (TAT) (please circle)</b>			Relinquished by <u>[Signature]</u>			Date <u>6/27/18</u>		Time <u>1530</u>		Received by _____		Date _____		Time _____			
Standard <input checked="" type="radio"/> 5 day    4 day 72 hour    48 hour    24 hour			Relinquished by _____			Date _____		Time _____		Received by _____		Date _____		Time _____			
<b>8 Data Package Options (please circle if required)</b>			Relinquished by Commercial Carrier:			UPS _____		FedEx <input checked="" type="checkbox"/>		Other _____		Received by <u>[Signature]</u>		Date <u>6/28/18</u>		Time <u>10:20</u>	
Type I - Full <input checked="" type="radio"/> Type VI (Raw Data) _____			Temperature Upon Receipt _____ °C			Custody Seals Intact? <input checked="" type="radio"/> Yes <input type="radio"/> No											



Client: Edmonds Terminal (Chevron)

**Delivery and Receipt Information**

Delivery Method: Fed Ex                      Arrival Timestamp: 06/28/2018 10:20  
 Number of Packages: 4                      Number of Projects: 1  
 State/Province of Origin: WA

**Arrival Condition Summary**

Shipping Container Sealed:	Yes	Sample IDs on COC match Containers:	Yes
Custody Seal Present:	Yes	Sample Date/Times match COC:	Yes
Custody Seal Intact:	Yes	VOA Vial Headspace ≥ 6mm:	Yes
Samples Chilled:	Yes	VOA IDs (≥ 6mm):	TB(1)
Paperwork Enclosed:	Yes	Total Trip Blank Qty:	2
Samples Intact:	Yes	Trip Blank Type:	HCl
Missing Samples:	No	Air Quality Samples Present:	No
Extra Samples:	No		
Discrepancy in Container Qty on COC:	No		

*Unpacked by Felix Gonzalez (13783) at 12:13 on 06/28/2018*

**Samples Chilled Details**

Thermometer Types: DT = Digital (Temp. Bottle)    IR = Infrared (Surface Temp)    All Temperatures in °C.

Cooler #	Thermometer ID	Corrected Temp	Therm. Type	Ice Type	Ice Present?	Ice Container	Elevated Temp?
1	DT42-01	2.2	DT	Wet	Y	Bagged	N
2	DT42-01	2.0	DT	Wet	Y	Bagged	N
3	DT42-01	1.0	DT	Wet	Y	Bagged	N
4	DT42-01	0.6	DT	Wet	Y	Bagged	N

General Comments: Received an extra metals batch QC bottle not on COC for MW-511, MW-534 and MW-519

# Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

<b>BMQL</b>	Below Minimum Quantitation Level	<b>mL</b>	milliliter(s)
<b>C</b>	degrees Celsius	<b>MPN</b>	Most Probable Number
<b>cfu</b>	colony forming units	<b>N.D.</b>	non-detect
<b>CP Units</b>	cobalt-chloroplatinate units	<b>ng</b>	nanogram(s)
<b>F</b>	degrees Fahrenheit	<b>NTU</b>	nephelometric turbidity units
<b>g</b>	gram(s)	<b>pg/L</b>	picogram/liter
<b>IU</b>	International Units	<b>RL</b>	Reporting Limit
<b>kg</b>	kilogram(s)	<b>TNTC</b>	Too Numerous To Count
<b>L</b>	liter(s)	<b>µg</b>	microgram(s)
<b>lb.</b>	pound(s)	<b>µL</b>	microliter(s)
<b>m3</b>	cubic meter(s)	<b>umhos/cm</b>	micromhos/cm
<b>meq</b>	milliequivalents	<b>MCL</b>	Maximum Contamination Limit
<b>mg</b>	milligram(s)		
<b>&lt;</b>	less than		
<b>&gt;</b>	greater than		
<b>ppm</b>	parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.		
<b>ppb</b>	parts per billion		
<b>Dry weight basis</b>	Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.		

**Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.**

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

This report shall not be reproduced except in full, without the written approval of the laboratory.

Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as “analyze immediately” are not performed within 15 minutes.

**WARRANTY AND LIMITS OF LIABILITY** - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. THE FOREGOING EXPRESS WARRANTY IS EXCLUSIVE AND IS GIVEN IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. WE DISCLAIM ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING A WARRANTY OF FITNESS FOR PARTICULAR PURPOSE AND WARRANTY OF MERCHANTABILITY. IN NO EVENT SHALL EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL, LLC BE LIABLE FOR INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR LOSS OF PROFIT OR GOODWILL REGARDLESS OF (A) THE NEGLIGENCE (EITHER SOLE OR CONCURRENT) OF EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL AND (B) WHETHER EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL HAS BEEN INFORMED OF THE POSSIBILITY OF SUCH DAMAGES. We accept no legal responsibility for the purposes for which the client uses the test results. No purchase order or other order for work shall be accepted by Eurofins Lancaster Laboratories Environmental which includes any conditions that vary from the Standard Terms and Conditions, and Eurofins Lancaster Laboratories Environmental hereby objects to any conflicting terms contained in any acceptance or order submitted by client.

# Data Qualifiers

Qualifier	Definition
C	Result confirmed by reanalysis
D1	Indicates for dual column analyses that the result is reported from column 1
D2	Indicates for dual column analyses that the result is reported from column 2
E	Concentration exceeds the calibration range
K1	Initial Calibration Blank is above the QC limit and the sample result is ND
K2	Continuing Calibration Blank is above the QC limit and the sample result is ND
K3	Initial Calibration Verification is above the QC limit and the sample result is ND
K4	Continuing Calibration Verification is above the QC limit and the sample result is ND
J (or G, I, X)	Estimated value $\geq$ the Method Detection Limit (MDL or DL) and $<$ the Limit of Quantitation (LOQ or RL)
P	Concentration difference between the primary and confirmation column $>40\%$ . The lower result is reported.
U	Analyte was not detected at the value indicated
V	Concentration difference between the primary and confirmation column $>100\%$ . The reporting limit is raised due to this disparity and evident interference.
W	The dissolved oxygen uptake for the unseeded blank is greater than 0.20 mg/L.
Z	Laboratory Defined - see analysis report

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods. Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.



## ANALYSIS REPORT

Prepared by:

Eurofins Lancaster Laboratories Environmental  
2425 New Holland Pike  
Lancaster, PA 17601

Prepared for:

Chevron Environmental Mgmt Co  
BR1 X5139C  
6101 Bollinger Canyon Road  
San Ramon CA 94583

Report Date: July 26, 2018 13:26

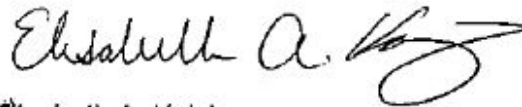
### Project: Edmonds Terminal

Account #: 11964  
Group Number: 1961024  
PO Number: 0015268291  
Release Number: JOLITZ  
State of Sample Origin: WA

Electronic Copy To Arcadis  
Electronic Copy To ARCADIS U.S., Inc.  
Electronic Copy To Arcadis  
Electronic Copy To Arcadis  
Electronic Copy To Arcadis  
Electronic Copy To Arcadis

Attn: Scott Zorn  
Attn: Sam Miles  
Attn: Jason Little  
Attn: Ryan Brauchla  
Attn: Ophelie Encelle  
Attn: Eric Krueger

Respectfully Submitted,



Elisabeth A. Knisley  
Project Manager

(717) 556-7262

To view our laboratory's current scopes of accreditation please go to <http://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster-laboratories-environmental/resources/certifications/>. Historical copies may be requested through your project manager.



## SAMPLE INFORMATION

<u>Client Sample Description</u>	<u>Sample Collection Date/Time</u>	<u>ELLE#</u>
MW-101-W-180628 Grab Groundwater	06/28/2018 11:35	9684389
MW-139R-W-180628 Grab Groundwater	06/28/2018 11:25	9684390
MW-503-W-180628 Grab Groundwater	06/28/2018 09:00	9684391
MW-504-W-180628 Grab Groundwater	06/28/2018 10:20	9684392
MW-505-W-180628 Grab Groundwater	06/28/2018 10:50	9684393
MW-506-W-180628 Grab Groundwater	06/28/2018 09:40	9684394
MW-507-W-180628 Grab Groundwater	06/28/2018 08:30	9684395
MW-509-W-180628 Grab Groundwater	06/28/2018 08:35	9684396
MW-509-W-180628 MS Grab Groundwater	06/28/2018 08:35	9684397
MW-509-W-180628 MSD Grab Groundwater	06/28/2018 08:35	9684398
MW-509-W-180628 DUP Grab Groundwater	06/28/2018 08:35	9684399
MW-512-W-180628 Grab Groundwater	06/28/2018 08:40	9684400
MW-513-W-180628 Grab Groundwater	06/28/2018 10:40	9684401
MW-514-W-180628 Grab Groundwater	06/28/2018 09:50	9684402
MW-515-W-180628 Grab Groundwater	06/28/2018 10:25	9684403
MW-516-W-180628 Grab Groundwater	06/28/2018 11:20	9684404
MW-517-W-180628 Grab Groundwater	06/28/2018 12:35	9684405
MW-518-W-180628 Grab Groundwater	06/28/2018 12:50	9684406
MW-520-W-180628 Grab Groundwater	06/28/2018 11:30	9684407
MW-521-W-180628 Grab Groundwater	06/28/2018 12:30	9684408
MW-522-W-180628 Grab Groundwater	06/28/2018 14:00	9684409
DUP-2-WD-180628 Grab Groundwater	06/28/2018	9684410
DUP-3-WD-180628 Grab Groundwater	06/28/2018	9684411
DUP-4-WD-180628 Grab Groundwater	06/28/2018	9684412
Trip Blank-T-180628 NA Water	06/28/2018	9684413

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

**Sample Description:** MW-101-W-180628 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9684389  
**ELLE Group #:** 1961024  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 06/29/2018 10:40

**Collection Date/Time:** 06/28/2018 11:35

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>					
		<b>SW-846 8270C SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14243	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14243	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14243	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14243	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14243	Chrysene	218-01-9	N.D.	0.01	1
14243	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14243	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>					
		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	50	1
<b>GC Volatiles</b>					
		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1
<b>GC Miscellaneous</b>					
		<b>RSKSOP-175 modified</b>	<b>ug/l</b>	<b>ug/l</b>	
07105	Methane	74-82-8	320	3.0	1
<b>GC Petroleum Hydrocarbons w/Si</b>					
		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	45	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1
<b>Metals Dissolved</b>					
		<b>EPA 200.8 rev 5.4</b>	<b>ug/l</b>	<b>ug/l</b>	
06037	Manganese	7439-96-5	65.4	4.9	1
<b>Wet Chemistry</b>					
		<b>EPA 300.0</b>	<b>ug/l</b>	<b>ug/l</b>	
00368	Nitrate Nitrogen	14797-55-8	450	250	5
00228	Sulfate	14808-79-8	10,200	1,500	5

### Sample Comments

State of Washington Lab Certification No. C457  
This sample was field filtered for dissolved metals.  
Carcinogenic PAHs have been reported for this sample

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14243	SIM SVOAs 8270C MINI	SW-846 8270C SIM	1	18184WAK026	07/06/2018 15:14	Catherine E Bachman	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18184WAK026	07/05/2018 08:00	Logan M Brosemer	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18182A94A	07/02/2018 16:37	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18182A94A	07/02/2018 16:37	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18182A94A	07/02/2018 16:37	Jeremy C Giffin	1
07105	Volatile Headspace Hydrocarbon	RSKSOP-175 modified	1	181830002A	07/02/2018 14:23	Johanna C Kennedy	1



**Sample Description:** MW-101-W-180628 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9684389  
**ELLE Group #:** 1961024  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submittal Date/Time:** 06/29/2018 10:40

**Collection Date/Time:** 06/28/2018 11:35

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	181840030A	07/11/2018 04:57	Amy Lehr	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	181840030A	07/03/2018 19:15	Kate E Lutte	1
06037	Manganese	EPA 200.8 rev 5.4	1	181830705001A	07/05/2018 10:24	Patrick J Engle	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	181830705001	07/02/2018 15:30	JoElla L Rice	1
00368	Nitrate Nitrogen	EPA 300.0	1	18180987109A	06/29/2018 22:55	Clinton M Wilson	5
00228	Sulfate	EPA 300.0	1	18180987109A	06/29/2018 22:55	Clinton M Wilson	5

**Sample Description:** MW-139R-W-180628 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9684390  
**ELLE Group #:** 1961024  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 06/29/2018 10:40

**Collection Date/Time:** 06/28/2018 11:25

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>					
<b>SW-846 8270C SIM</b>			<b>ug/l</b>	<b>ug/l</b>	
14243	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14243	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14243	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14243	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14243	Chrysene	218-01-9	N.D.	0.01	1
14243	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14243	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>					
<b>ECY 97-602 NWTPH-Gx</b>			<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	50	1
<b>GC Volatiles</b>					
<b>SW-846 8021B</b>			<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1
<b>GC Miscellaneous</b>					
<b>RSKSOP-175 modified</b>			<b>ug/l</b>	<b>ug/l</b>	
07105	Methane	74-82-8	80	3.0	1
<b>GC Petroleum Hydrocarbons w/Si</b>					
<b>ECY 97-602 NWTPH-Dx modified</b>			<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	47	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1
<b>Metals Dissolved</b>					
<b>EPA 200.8 rev 5.4</b>			<b>ug/l</b>	<b>ug/l</b>	
06037	Manganese	7439-96-5	129	4.9	1
<b>Wet Chemistry</b>					
<b>EPA 300.0</b>			<b>ug/l</b>	<b>ug/l</b>	
00368	Nitrate Nitrogen	14797-55-8	540	250	5
00228	Sulfate	14808-79-8	24,000	1,500	5

### Sample Comments

State of Washington Lab Certification No. C457  
This sample was field filtered for dissolved metals.  
Carcinogenic PAHs have been reported for this sample

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14243	SIM SVOAs 8270C MINI	SW-846 8270C SIM	1	18184WAK026	07/06/2018 15:42	Catherine E Bachman	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18184WAK026	07/05/2018 08:00	Logan M Brosemer	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18182A94A	07/02/2018 17:03	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18182A94A	07/02/2018 17:03	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18182A94A	07/02/2018 17:03	Jeremy C Giffin	1
07105	Volatile Headspace Hydrocarbon	RSKSOP-175 modified	1	181830002A	07/02/2018 14:40	Johanna C Kennedy	1

**Sample Description:** MW-139R-W-180628 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9684390  
**ELLE Group #:** 1961024  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submittal Date/Time:** 06/29/2018 10:40  
**Collection Date/Time:** 06/28/2018 11:25

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	181840030A	07/11/2018 05:21	Amy Lehr	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	181840030A	07/03/2018 19:15	Kate E Lutte	1
06037	Manganese	EPA 200.8 rev 5.4	1	181830705001A	07/05/2018 10:12	Patrick J Engle	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	181830705001	07/02/2018 15:30	JoElla L Rice	1
00368	Nitrate Nitrogen	EPA 300.0	1	18180987109A	06/29/2018 23:49	Clinton M Wilson	5
00228	Sulfate	EPA 300.0	1	18180987109A	06/29/2018 23:49	Clinton M Wilson	5

**Sample Description:** MW-503-W-180628 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9684391  
**ELLE Group #:** 1961024  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 06/29/2018 10:40

**Collection Date/Time:** 06/28/2018 09:00

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>					
<b>SW-846 8270C SIM</b>			<b>ug/l</b>	<b>ug/l</b>	
14243	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14243	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14243	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14243	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14243	Chrysene	218-01-9	N.D.	0.01	1
14243	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14243	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>					
<b>ECY 97-602 NWTPH-Gx</b>			<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	50	1
<b>GC Volatiles</b>					
<b>SW-846 8021B</b>			<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1
<b>GC Miscellaneous</b>					
<b>RSKSOP-175 modified</b>			<b>ug/l</b>	<b>ug/l</b>	
07105	Methane	74-82-8	140	3.0	1
<b>GC Petroleum Hydrocarbons w/Si</b>					
<b>ECY 97-602 NWTPH-Dx modified</b>			<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	48	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	110	1
<b>Metals Dissolved</b>					
<b>EPA 200.8 rev 5.4</b>			<b>ug/l</b>	<b>ug/l</b>	
06037	Manganese	7439-96-5	608	4.9	1
<b>Wet Chemistry</b>					
<b>EPA 300.0</b>			<b>ug/l</b>	<b>ug/l</b>	
00368	Nitrate Nitrogen	14797-55-8	N.D.	250	5
00228	Sulfate	14808-79-8	35,200	1,500	5

### Sample Comments

State of Washington Lab Certification No. C457  
This sample was field filtered for dissolved metals.  
Carcinogenic PAHs have been reported for this sample

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14243	SIM SVOAs 8270C MINI	SW-846 8270C SIM	1	18184WAK026	07/06/2018 16:10	Catherine E Bachman	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18184WAK026	07/05/2018 08:00	Logan M Brosemer	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18182A94A	07/02/2018 17:28	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18182A94A	07/02/2018 17:28	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18182A94A	07/02/2018 17:28	Jeremy C Giffin	1
07105	Volatile Headspace Hydrocarbon	RSKSOP-175 modified	1	181830002A	07/02/2018 14:57	Johanna C Kennedy	1

**Sample Description:** MW-503-W-180628 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9684391  
**ELLE Group #:** 1961024  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submittal Date/Time:** 06/29/2018 10:40  
**Collection Date/Time:** 06/28/2018 09:00

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	181840030A	07/11/2018 05:44	Amy Lehr	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	181840030A	07/03/2018 19:15	Kate E Lutte	1
06037	Manganese	EPA 200.8 rev 5.4	1	181830705001A	07/05/2018 10:29	Patrick J Engle	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	181830705001	07/02/2018 15:30	JoElla L Rice	1
00368	Nitrate Nitrogen	EPA 300.0	1	18180987109A	06/30/2018 00:06	Clinton M Wilson	5
00228	Sulfate	EPA 300.0	1	18180987109A	06/30/2018 00:06	Clinton M Wilson	5

**Sample Description:** MW-504-W-180628 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9684392  
**ELLE Group #:** 1961024  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 06/29/2018 10:40

**Collection Date/Time:** 06/28/2018 10:20

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>					
<b>SW-846 8270C SIM</b>			<b>ug/l</b>	<b>ug/l</b>	
14243	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14243	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14243	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14243	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14243	Chrysene	218-01-9	N.D.	0.01	1
14243	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14243	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>					
<b>ECY 97-602 NWTPH-Gx</b>			<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	50	1
<b>GC Volatiles</b>					
<b>SW-846 8021B</b>			<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1
<b>GC Miscellaneous</b>					
<b>RSKSOP-175 modified</b>			<b>ug/l</b>	<b>ug/l</b>	
07105	Methane	74-82-8	450	3.0	1
<b>GC Petroleum Hydrocarbons w/Si</b>					
<b>ECY 97-602 NWTPH-Dx modified</b>			<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	47	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1
<b>Metals Dissolved</b>					
<b>EPA 200.8 rev 5.4</b>			<b>ug/l</b>	<b>ug/l</b>	
06037	Manganese	7439-96-5	1,920	24.4	5
<b>Wet Chemistry</b>					
<b>EPA 300.0</b>			<b>ug/l</b>	<b>ug/l</b>	
00368	Nitrate Nitrogen	14797-55-8	N.D.	250	5
00228	Sulfate	14808-79-8	51,900	1,500	5

### Sample Comments

State of Washington Lab Certification No. C457  
This sample was field filtered for dissolved metals.  
Carcinogenic PAHs have been reported for this sample

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14243	SIM SVOAs 8270C MINI	SW-846 8270C SIM	1	18184WAK026	07/06/2018 16:39	Catherine E Bachman	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18184WAK026	07/05/2018 08:00	Logan M Brosemer	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18182A94A	07/02/2018 17:54	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18182A94A	07/02/2018 17:54	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18182A94A	07/02/2018 17:54	Jeremy C Giffin	1
07105	Volatile Headspace Hydrocarbon	RSKSOP-175 modified	1	181830002A	07/02/2018 15:31	Johanna C Kennedy	1

**Sample Description:** MW-504-W-180628 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9684392  
**ELLE Group #:** 1961024  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submittal Date/Time:** 06/29/2018 10:40

**Collection Date/Time:** 06/28/2018 10:20

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	181840030A	07/11/2018 06:07	Amy Lehr	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	181840030A	07/03/2018 19:15	Kate E Lutte	1
06037	Manganese	EPA 200.8 rev 5.4	1	181830705005A	07/16/2018 05:09	Choon Y Tian	5
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	181830705005	07/03/2018 05:08	James L Mertz	1
00368	Nitrate Nitrogen	EPA 300.0	1	18180987109A	06/30/2018 00:24	Clinton M Wilson	5
00228	Sulfate	EPA 300.0	1	18180987109A	06/30/2018 00:24	Clinton M Wilson	5

**Sample Description:** MW-505-W-180628 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9684393  
**ELLE Group #:** 1961024  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 06/29/2018 10:40

**Collection Date/Time:** 06/28/2018 10:50

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>					
		<b>SW-846 8270C SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14243	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14243	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14243	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14243	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14243	Chrysene	218-01-9	N.D.	0.01	1
14243	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14243	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>					
		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	50	1
<b>GC Volatiles</b>					
		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1
<b>GC Miscellaneous</b>					
		<b>RSKSOP-175 modified</b>	<b>ug/l</b>	<b>ug/l</b>	
07105	Methane	74-82-8	530	15	5
<b>GC Petroleum Hydrocarbons w/Si</b>					
		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	46	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1
<b>Metals Dissolved</b>					
		<b>EPA 200.8 rev 5.4</b>	<b>ug/l</b>	<b>ug/l</b>	
06037	Manganese	7439-96-5	871	4.9	1
<b>Wet Chemistry</b>					
		<b>EPA 300.0</b>	<b>ug/l</b>	<b>ug/l</b>	
00368	Nitrate Nitrogen	14797-55-8	N.D.	250	5
00228	Sulfate	14808-79-8	40,400	1,500	5

### Sample Comments

State of Washington Lab Certification No. C457  
This sample was field filtered for dissolved metals.  
Carcinogenic PAHs have been reported for this sample

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14243	SIM SVOAs 8270C MINI	SW-846 8270C SIM	1	18184WAK026	07/06/2018 17:07	Catherine E Bachman	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18184WAK026	07/05/2018 08:00	Logan M Brosemer	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18182A94A	07/02/2018 18:19	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18182A94A	07/02/2018 18:19	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18182A94A	07/02/2018 18:19	Jeremy C Giffin	1
07105	Volatile Headspace Hydrocarbon	RSKSOP-175 modified	1	181830002A	07/03/2018 15:52	Johanna C Kennedy	5



**Sample Description:** MW-505-W-180628 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9684393  
**ELLE Group #:** 1961024  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submittal Date/Time:** 06/29/2018 10:40

**Collection Date/Time:** 06/28/2018 10:50

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	181840030A	07/11/2018 07:16	Amy Lehr	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	181840030A	07/03/2018 19:15	Kate E Lutte	1
06037	Manganese	EPA 200.8 rev 5.4	1	181830705005A	07/12/2018 19:37	Bradley M Berlot	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	181830705005	07/03/2018 05:08	James L Mertz	1
00368	Nitrate Nitrogen	EPA 300.0	1	18180987109A	06/30/2018 00:42	Clinton M Wilson	5
00228	Sulfate	EPA 300.0	1	18180987109A	06/30/2018 00:42	Clinton M Wilson	5

**Sample Description:** MW-506-W-180628 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9684394  
**ELLE Group #:** 1961024  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 06/29/2018 10:40  
**Collection Date/Time:** 06/28/2018 09:40

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>					
<b>SW-846 8270C SIM</b>			<b>ug/l</b>	<b>ug/l</b>	
14243	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14243	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14243	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14243	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14243	Chrysene	218-01-9	N.D.	0.01	1
14243	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14243	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>					
<b>ECY 97-602 NWTPH-Gx</b>			<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	50	1
<b>GC Volatiles</b>					
<b>SW-846 8021B</b>			<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1
<b>GC Miscellaneous</b>					
<b>RSKSOP-175 modified</b>			<b>ug/l</b>	<b>ug/l</b>	
07105	Methane	74-82-8	12,000	300	100
<b>GC Petroleum Hydrocarbons w/Si</b>					
<b>ECY 97-602 NWTPH-Dx modified</b>			<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	47	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1
<b>Metals Dissolved</b>					
<b>EPA 200.8 rev 5.4</b>			<b>ug/l</b>	<b>ug/l</b>	
06037	Manganese	7439-96-5	994	4.9	1
<b>Wet Chemistry</b>					
<b>EPA 300.0</b>			<b>ug/l</b>	<b>ug/l</b>	
00368	Nitrate Nitrogen	14797-55-8	N.D.	250	5
00228	Sulfate	14808-79-8	N.D.	1,500	5

### Sample Comments

State of Washington Lab Certification No. C457  
This sample was field filtered for dissolved metals.  
Carcinogenic PAHs have been reported for this sample

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14243	SIM SVOAs 8270C MINI	SW-846 8270C SIM	1	18184WAK026	07/06/2018 17:35	Catherine E Bachman	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18184WAK026	07/05/2018 08:00	Logan M Brosemer	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18182A94A	07/02/2018 18:45	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18182A94A	07/02/2018 18:45	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18182A94A	07/02/2018 18:45	Jeremy C Giffin	1
07105	Volatile Headspace Hydrocarbon	RSKSOP-175 modified	1	181830002A	07/03/2018 15:36	Johanna C Kennedy	100

**Sample Description:** MW-506-W-180628 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9684394  
**ELLE Group #:** 1961024  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submittal Date/Time:** 06/29/2018 10:40

**Collection Date/Time:** 06/28/2018 09:40

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	181840030A	07/11/2018 07:39	Amy Lehr	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	181840030A	07/03/2018 19:15	Kate E Lutte	1
06037	Manganese	EPA 200.8 rev 5.4	1	181830705005A	07/12/2018 19:39	Bradley M Berlot	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	181830705005	07/03/2018 05:08	James L Mertz	1
00368	Nitrate Nitrogen	EPA 300.0	1	18180987109A	06/30/2018 01:00	Clinton M Wilson	5
00228	Sulfate	EPA 300.0	1	18180987109A	06/30/2018 01:00	Clinton M Wilson	5

**Sample Description:** MW-507-W-180628 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9684395  
**ELLE Group #:** 1961024  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 06/29/2018 10:40  
**Collection Date/Time:** 06/28/2018 08:30

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>					
<b>SW-846 8270C SIM</b>			<b>ug/l</b>	<b>ug/l</b>	
14243	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14243	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14243	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14243	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14243	Chrysene	218-01-9	N.D.	0.01	1
14243	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14243	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>					
<b>ECY 97-602 NWTPH-Gx</b>			<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	50	1
<b>GC Volatiles</b>					
<b>SW-846 8021B</b>			<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1
<b>GC Miscellaneous</b>					
<b>RSKSOP-175 modified</b>			<b>ug/l</b>	<b>ug/l</b>	
07105	Methane	74-82-8	100	3.0	1
<b>GC Petroleum Hydrocarbons w/Si</b>					
<b>ECY 97-602 NWTPH-Dx modified</b>			<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	46	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1
<b>Metals Dissolved</b>					
<b>EPA 200.8 rev 5.4</b>			<b>ug/l</b>	<b>ug/l</b>	
06037	Manganese	7439-96-5	197	4.9	1
<b>Wet Chemistry</b>					
<b>EPA 300.0</b>			<b>ug/l</b>	<b>ug/l</b>	
00368	Nitrate Nitrogen	14797-55-8	N.D.	250	5
00228	Sulfate	14808-79-8	162,000	6,000	20

### Sample Comments

State of Washington Lab Certification No. C457  
This sample was field filtered for dissolved metals.  
Carcinogenic PAHs have been reported for this sample

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14243	SIM SVOAs 8270C MINI	SW-846 8270C SIM	1	18184WAK026	07/06/2018 18:04	Catherine E Bachman	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18184WAK026	07/05/2018 08:00	Logan M Brosemer	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18182A94A	07/02/2018 19:11	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18182A94A	07/02/2018 19:11	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18182A94A	07/02/2018 19:11	Jeremy C Giffin	1
07105	Volatile Headspace Hydrocarbon	RSKSOP-175 modified	1	181830002A	07/02/2018 16:25	Johanna C Kennedy	1

**Sample Description:** MW-507-W-180628 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9684395  
**ELLE Group #:** 1961024  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submittal Date/Time:** 06/29/2018 10:40

**Collection Date/Time:** 06/28/2018 08:30

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	181840030A	07/11/2018 08:02	Amy Lehr	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	181840030A	07/03/2018 19:15	Kate E Lutte	1
06037	Manganese	EPA 200.8 rev 5.4	1	181830705005A	07/12/2018 19:44	Bradley M Berlot	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	181830705005	07/03/2018 05:08	James L Mertz	1
00368	Nitrate Nitrogen	EPA 300.0	1	18180987109A	06/30/2018 01:17	Clinton M Wilson	5
00228	Sulfate	EPA 300.0	1	18180987109A	06/30/2018 01:35	Clinton M Wilson	20

**Sample Description:** MW-509-W-180628 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9684396  
**ELLE Group #:** 1961024  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 06/29/2018 10:40

**Collection Date/Time:** 06/28/2018 08:35

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>					
<b>SW-846 8270C SIM</b>			<b>ug/l</b>	<b>ug/l</b>	
14243	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14243	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14243	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14243	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14243	Chrysene	218-01-9	N.D.	0.01	1
14243	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14243	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>					
<b>ECY 97-602 NWTPH-Gx</b>			<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	50	1
<b>GC Volatiles</b>					
<b>SW-846 8021B</b>			<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1
<b>GC Miscellaneous</b>					
<b>RSKSOP-175 modified</b>			<b>ug/l</b>	<b>ug/l</b>	
07105	Methane	74-82-8	12	3.0	1
<b>GC Petroleum Hydrocarbons w/Si</b>					
<b>ECY 97-602 NWTPH-Dx modified</b>			<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	47	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	110	1
<b>Metals Dissolved</b>					
<b>EPA 200.8 rev 5.4</b>			<b>ug/l</b>	<b>ug/l</b>	
06037	Manganese	7439-96-5	168	4.9	1
<b>Wet Chemistry</b>					
<b>EPA 300.0</b>			<b>ug/l</b>	<b>ug/l</b>	
00368	Nitrate Nitrogen	14797-55-8	N.D.	250	5
00228	Sulfate	14808-79-8	73,100	1,500	5

### Sample Comments

State of Washington Lab Certification No. C457  
This sample was field filtered for dissolved metals.  
Carcinogenic PAHs have been reported for this sample

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14243	SIM SVOAs 8270C MINI	SW-846 8270C SIM	1	18184WAK026	07/06/2018 13:20	Catherine E Bachman	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18184WAK026	07/05/2018 08:00	Logan M Brosemer	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18182A94A	07/02/2018 19:36	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18182A94A	07/02/2018 19:36	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18182A94A	07/02/2018 19:36	Jeremy C Giffin	1
07105	Volatile Headspace Hydrocarbon	RSKSOP-175 modified	1	181830002A	07/02/2018 13:16	Johanna C Kennedy	1

**Sample Description:** MW-509-W-180628 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9684396  
**ELLE Group #:** 1961024  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submittal Date/Time:** 06/29/2018 10:40

**Collection Date/Time:** 06/28/2018 08:35

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	181840030A	07/11/2018 03:47	Amy Lehr	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	181840030A	07/03/2018 19:15	Kate E Lutte	1
06037	Manganese	EPA 200.8 rev 5.4	1	181830705005A	07/12/2018 19:26	Bradley M Berlot	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	181830705005	07/03/2018 05:08	James L Mertz	1
00368	Nitrate Nitrogen	EPA 300.0	1	18180987109A	06/29/2018 21:27	Clinton M Wilson	5
00228	Sulfate	EPA 300.0	1	18180987109A	06/29/2018 21:27	Clinton M Wilson	5

**Sample Description:** MW-509-W-180628 MS Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9684397  
**ELLE Group #:** 1961024  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 06/29/2018 10:40  
**Collection Date/Time:** 06/28/2018 08:35

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>					
<b>SW-846 8270C SIM</b>			<b>ug/l</b>	<b>ug/l</b>	
14243	Benzo(a)anthracene	56-55-3	1	0.01	1
14243	Benzo(a)pyrene	50-32-8	0.4	0.01	1
14243	Benzo(b)fluoranthene	205-99-2	0.9	0.01	1
14243	Benzo(k)fluoranthene	207-08-9	0.8	0.01	1
14243	Chrysene	218-01-9	0.8	0.01	1
14243	Dibenz(a,h)anthracene	53-70-3	0.8	0.02	1
14243	Indeno(1,2,3-cd)pyrene	193-39-5	0.7	0.01	1
<b>GC Volatiles</b>					
<b>ECY 97-602 NWTPH-Gx</b>			<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	1,400	50	1
<b>GC Volatiles</b>					
<b>SW-846 8021B</b>			<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	21	0.5	1
<b>GC Miscellaneous</b>					
<b>RSKSOP-175 modified</b>			<b>ug/l</b>	<b>ug/l</b>	
07105	Methane	74-82-8	59	3.0	1
<b>GC Petroleum Hydrocarbons w/Si</b>					
<b>ECY 97-602 NWTPH-Dx modified</b>			<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	190	46	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1
<b>Metals Dissolved</b>					
<b>EPA 200.8 rev 5.4</b>			<b>ug/l</b>	<b>ug/l</b>	
06037	Manganese	7439-96-5	227	4.9	1
<b>Wet Chemistry</b>					
<b>EPA 300.0</b>			<b>ug/l</b>	<b>ug/l</b>	
00368	Nitrate Nitrogen	14797-55-8	2,700	250	5
00228	Sulfate	14808-79-8	103,000 E	1,500	5

### Sample Comments

State of Washington Lab Certification No. C457  
This sample was field filtered for dissolved metals.  
Carcinogenic PAHs have been reported for this sample

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14243	SIM SVOAs 8270C MINI	SW-846 8270C SIM	1	18184WAK026	07/06/2018 13:48	Catherine E Bachman	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18184WAK026	07/05/2018 08:00	Logan M Brosemer	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18182A94A	07/02/2018 20:53	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18182A94A	07/02/2018 20:02	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18182A94A	07/02/2018 20:02	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	2	18182A94A	07/02/2018 20:53	Jeremy C Giffin	1



**Sample Description:** MW-509-W-180628 MS Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9684397  
**ELLE Group #:** 1961024  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submittal Date/Time:** 06/29/2018 10:40  
**Collection Date/Time:** 06/28/2018 08:35

## Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07105	Volatile Headspace Hydrocarbon	RSKSOP-175 modified	1	181830002A	07/02/2018 13:33	Johanna C Kennedy	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	181840030A	07/11/2018 04:10	Amy Lehr	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	181840030A	07/03/2018 19:15	Kate E Lutte	1
06037	Manganese	EPA 200.8 rev 5.4	1	181830705005A	07/12/2018 19:32	Bradley M Berlot	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	181830705005	07/03/2018 05:08	James L Mertz	1
00368	Nitrate Nitrogen	EPA 300.0	1	18180987109A	06/29/2018 22:02	Clinton M Wilson	5
00228	Sulfate	EPA 300.0	1	18180987109A	06/29/2018 22:02	Clinton M Wilson	5

**Sample Description:** MW-509-W-180628 MSD Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9684398  
**ELLE Group #:** 1961024  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 06/29/2018 10:40  
**Collection Date/Time:** 06/28/2018 08:35

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>					
		<b>SW-846 8270C SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14243	Benzo(a)anthracene	56-55-3	0.9	0.01	1
14243	Benzo(a)pyrene	50-32-8	0.5	0.01	1
14243	Benzo(b)fluoranthene	205-99-2	0.9	0.01	1
14243	Benzo(k)fluoranthene	207-08-9	0.8	0.01	1
14243	Chrysene	218-01-9	0.8	0.01	1
14243	Dibenz(a,h)anthracene	53-70-3	0.7	0.02	1
14243	Indeno(1,2,3-cd)pyrene	193-39-5	0.7	0.01	1
<b>GC Volatiles</b>					
		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	1,400	50	1
<b>GC Volatiles</b>					
		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	21	0.5	1
<b>GC Miscellaneous</b>					
		<b>RSKSOP-175 modified</b>	<b>ug/l</b>	<b>ug/l</b>	
07105	Methane	74-82-8	66	3.0	1
<b>GC Petroleum Hydrocarbons w/Si</b>					
		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	200	46	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1

### Sample Comments

State of Washington Lab Certification No. C457  
This sample was field filtered for dissolved metals.  
Carcinogenic PAHs have been reported for this sample

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14243	SIM SVOAs 8270C MINI	SW-846 8270C SIM	1	18184WAK026	07/06/2018 14:17	Catherine E Bachman	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18184WAK026	07/05/2018 08:00	Logan M Brosemer	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18182A94A	07/02/2018 21:19	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18182A94A	07/02/2018 20:28	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18182A94A	07/02/2018 20:28	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	2	18182A94A	07/02/2018 21:19	Jeremy C Giffin	1
07105	Volatile Headspace Hydrocarbon	RSKSOP-175 modified	1	181830002A	07/02/2018 13:50	Johanna C Kennedy	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	181840030A	07/11/2018 04:34	Amy Lehr	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	181840030A	07/03/2018 19:15	Kate E Lutte	1

**Sample Description:** MW-509-W-180628 DUP Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9684399  
**ELLE Group #:** 1961024  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 06/29/2018 10:40  
**Collection Date/Time:** 06/28/2018 08:35

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>Metals Dissolved</b>					
<b>EPA 200.8 rev 5.4</b>			ug/l	ug/l	
06037	Manganese	7439-96-5	171	4.9	1
<b>Wet Chemistry</b>					
<b>EPA 300.0</b>			ug/l	ug/l	
00368	Nitrate Nitrogen	14797-55-8	N.D.	250	5
00228	Sulfate	14808-79-8	85,800	3,000	10

### Sample Comments

State of Washington Lab Certification No. C457  
This sample was field filtered for dissolved metals.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06037	Manganese	EPA 200.8 rev 5.4	1	181830705005A	07/12/2018 19:30	Bradley M Berlot	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	181830705005	07/03/2018 05:08	James L Mertz	1
00368	Nitrate Nitrogen	EPA 300.0	1	18180987109A	06/29/2018 21:44	Clinton M Wilson	5
00228	Sulfate	EPA 300.0	1	18180987109A	07/04/2018 13:17	Clinton M Wilson	10

**Sample Description:** MW-512-W-180628 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9684400  
**ELLE Group #:** 1961024  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 06/29/2018 10:40

**Collection Date/Time:** 06/28/2018 08:40

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>					
		<b>SW-846 8270C SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14243	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14243	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14243	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14243	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14243	Chrysene	218-01-9	N.D.	0.01	1
14243	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14243	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>					
		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	50	1
<b>GC Volatiles</b>					
		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1
<b>GC Miscellaneous</b>					
		<b>RSKSOP-175 modified</b>	<b>ug/l</b>	<b>ug/l</b>	
07105	Methane	74-82-8	68	3.0	1
<b>GC Petroleum Hydrocarbons w/Si</b>					
		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	50	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	110	1
<b>Metals Dissolved</b>					
		<b>EPA 200.8 rev 5.4</b>	<b>ug/l</b>	<b>ug/l</b>	
06037	Manganese	7439-96-5	39.0	4.9	1
<b>Wet Chemistry</b>					
		<b>EPA 300.0</b>	<b>ug/l</b>	<b>ug/l</b>	
00368	Nitrate Nitrogen	14797-55-8	280	250	5
00228	Sulfate	14808-79-8	21,300	1,500	5

### Sample Comments

State of Washington Lab Certification No. C457  
This sample was field filtered for dissolved metals.  
Carcinogenic PAHs have been reported for this sample

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14243	SIM SVOAs 8270C MINI	SW-846 8270C SIM	1	18184WAK026	07/06/2018 18:32	Catherine E Bachman	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18184WAK026	07/05/2018 08:00	Logan M Brosemer	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18182A94A	07/02/2018 22:35	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18182A94A	07/02/2018 22:35	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18182A94A	07/02/2018 22:35	Jeremy C Giffin	1
07105	Volatile Headspace Hydrocarbon	RSKSOP-175 modified	1	181830002A	07/02/2018 16:42	Johanna C Kennedy	1

**Sample Description:** MW-512-W-180628 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9684400  
**ELLE Group #:** 1961024  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submittal Date/Time:** 06/29/2018 10:40

**Collection Date/Time:** 06/28/2018 08:40

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	181840030A	07/11/2018 08:25	Amy Lehr	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	181840030A	07/03/2018 19:15	Kate E Lutte	1
06037	Manganese	EPA 200.8 rev 5.4	1	181830705005A	07/12/2018 19:46	Bradley M Berlot	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	181830705005	07/03/2018 05:08	James L Mertz	1
00368	Nitrate Nitrogen	EPA 300.0	1	18180987109A	06/30/2018 01:53	Clinton M Wilson	5
00228	Sulfate	EPA 300.0	1	18180987109A	06/30/2018 01:53	Clinton M Wilson	5

**Sample Description:** MW-513-W-180628 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9684401  
**ELLE Group #:** 1961024  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 06/29/2018 10:40  
**Collection Date/Time:** 06/28/2018 10:40

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>					
		<b>SW-846 8270C SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14243	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14243	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14243	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14243	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14243	Chrysene	218-01-9	N.D.	0.01	1
14243	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14243	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>					
		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	50	1
<b>GC Volatiles</b>					
		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1
<b>GC Miscellaneous</b>					
		<b>RSKSOP-175 modified</b>	<b>ug/l</b>	<b>ug/l</b>	
07105	Methane	74-82-8	610	15	5
<b>GC Petroleum Hydrocarbons w/Si</b>					
		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	49	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	110	1
<b>Trial ID: RE</b>					
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	49	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	110	1
<p>The recovery for the sample surrogate(s) is outside the QC acceptance limits as noted on the QC Summary. The following action was taken: The sample was re-extracted within the method required holding time and the sample surrogate(s) is compliant. The recovery for a target analyte(s) in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary in the second trial. Both trials are reported.</p>					
<b>Metals Dissolved</b>					
		<b>EPA 200.8 rev 5.4</b>	<b>ug/l</b>	<b>ug/l</b>	
06037	Manganese	7439-96-5	1,330	4.9	1
<b>Wet Chemistry</b>					
		<b>EPA 300.0</b>	<b>ug/l</b>	<b>ug/l</b>	
00368	Nitrate Nitrogen	14797-55-8	N.D.	250	5
00228	Sulfate	14808-79-8	34,300	1,500	5

### Sample Comments

State of Washington Lab Certification No. C457  
This sample was field filtered for dissolved metals.  
Carcinogenic PAHs have been reported for this sample

**Sample Description:** MW-513-W-180628 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9684401  
**ELLE Group #:** 1961024  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 06/29/2018 10:40

**Collection Date/Time:** 06/28/2018 10:40

## Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14243	SIM SVOAs 8270C MINI	SW-846 8270C SIM	1	18184WAK026	07/06/2018 19:01	Catherine E Bachman	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18184WAK026	07/05/2018 08:00	Logan M Brosemer	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18182A94A	07/02/2018 23:00	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18182A94A	07/02/2018 23:00	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18182A94A	07/02/2018 23:00	Jeremy C Giffin	1
07105	Volatile Headspace Hydrocarbon	RSKSOP-175 modified	1	181830003A	07/03/2018 17:18	Johanna C Kennedy	5
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	181840030A	07/11/2018 08:49	Amy Lehr	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	2-RE	181930005A	07/17/2018 04:27	Amy Lehr	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	181840030A	07/03/2018 19:15	Kate E Lutte	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	3	181930005A	07/12/2018 17:00	Oswaldo R Sanchez	1
06037	Manganese	EPA 200.8 rev 5.4	1	181830705005A	07/12/2018 19:48	Bradley M Berlot	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	181830705005	07/03/2018 05:08	James L Mertz	1
00368	Nitrate Nitrogen	EPA 300.0	1	18180987109A	06/30/2018 02:11	Clinton M Wilson	5
00228	Sulfate	EPA 300.0	1	18180987109A	06/30/2018 02:11	Clinton M Wilson	5

**Sample Description:** MW-514-W-180628 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9684402  
**ELLE Group #:** 1961024  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 06/29/2018 10:40  
**Collection Date/Time:** 06/28/2018 09:50

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>					
<b>SW-846 8270C SIM</b>			<b>ug/l</b>	<b>ug/l</b>	
14243	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14243	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14243	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14243	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14243	Chrysene	218-01-9	N.D.	0.01	1
14243	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14243	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>					
<b>ECY 97-602 NWTPH-Gx</b>			<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	50	1
<b>GC Volatiles</b>					
<b>SW-846 8021B</b>			<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1
<b>GC Miscellaneous</b>					
<b>RSKSOP-175 modified</b>			<b>ug/l</b>	<b>ug/l</b>	
07105	Methane	74-82-8	190	3.0	1
<b>GC Petroleum Hydrocarbons w/Si</b>					
<b>ECY 97-602 NWTPH-Dx modified</b>			<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	49	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	110	1
<b>Metals Dissolved</b>					
<b>EPA 200.8 rev 5.4</b>			<b>ug/l</b>	<b>ug/l</b>	
06037	Manganese	7439-96-5	155	4.9	1
<b>Wet Chemistry</b>					
<b>EPA 300.0</b>			<b>ug/l</b>	<b>ug/l</b>	
00368	Nitrate Nitrogen	14797-55-8	280	250	5
00228	Sulfate	14808-79-8	23,100	1,500	5

### Sample Comments

State of Washington Lab Certification No. C457  
This sample was field filtered for dissolved metals.  
Carcinogenic PAHs have been reported for this sample

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14243	SIM SVOAs 8270C MINI	SW-846 8270C SIM	1	18184WAK026	07/06/2018 22:26	Catherine E Bachman	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18184WAK026	07/05/2018 08:00	Logan M Brosemer	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18182A94A	07/02/2018 23:26	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18182A94A	07/02/2018 23:26	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18182A94A	07/02/2018 23:26	Jeremy C Giffin	1
07105	Volatile Headspace Hydrocarbon	RSKSOP-175 modified	1	181830003A	07/02/2018 20:22	Johanna C Kennedy	1



**Sample Description:** MW-514-W-180628 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9684402  
**ELLE Group #:** 1961024  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submittal Date/Time:** 06/29/2018 10:40

**Collection Date/Time:** 06/28/2018 09:50

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	181860006A	07/10/2018 05:28	Amy Lehr	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	181860006A	07/05/2018 19:30	Kate E Lutte	1
06037	Manganese	EPA 200.8 rev 5.4	1	181830705006A	07/12/2018 09:20	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	181830705006	07/03/2018 05:08	James L Mertz	1
00368	Nitrate Nitrogen	EPA 300.0	1	18180987109B	06/30/2018 02:28	Clinton M Wilson	5
00228	Sulfate	EPA 300.0	1	18180987109B	06/30/2018 02:28	Clinton M Wilson	5

**Sample Description:** MW-515-W-180628 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9684403  
**ELLE Group #:** 1961024  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 06/29/2018 10:40

**Collection Date/Time:** 06/28/2018 10:25

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>					
<b>SW-846 8270C SIM</b>			<b>ug/l</b>	<b>ug/l</b>	
14243	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14243	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14243	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14243	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14243	Chrysene	218-01-9	N.D.	0.01	1
14243	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14243	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>					
<b>ECY 97-602 NWTPH-Gx</b>			<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	50	1
<b>GC Volatiles</b>					
<b>SW-846 8021B</b>			<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1
<b>GC Miscellaneous</b>					
<b>RSKSOP-175 modified</b>			<b>ug/l</b>	<b>ug/l</b>	
07105	Methane	74-82-8	81	3.0	1
<b>GC Petroleum Hydrocarbons w/Si</b>					
<b>ECY 97-602 NWTPH-Dx modified</b>			<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	47	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	110	1
<b>Metals Dissolved</b>					
<b>EPA 200.8 rev 5.4</b>			<b>ug/l</b>	<b>ug/l</b>	
06037	Manganese	7439-96-5	93.3	4.9	1
<b>Wet Chemistry</b>					
<b>EPA 300.0</b>			<b>ug/l</b>	<b>ug/l</b>	
00368	Nitrate Nitrogen	14797-55-8	N.D.	250	5
00228	Sulfate	14808-79-8	30,200	1,500	5

### Sample Comments

State of Washington Lab Certification No. C457  
This sample was field filtered for dissolved metals.  
Carcinogenic PAHs have been reported for this sample

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14243	SIM SVOAs 8270C MINI	SW-846 8270C SIM	1	18184WAK026	07/06/2018 22:54	Catherine E Bachman	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18184WAK026	07/05/2018 08:00	Logan M Brosemer	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18182A94A	07/02/2018 23:52	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18182A94A	07/02/2018 23:52	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18182A94A	07/02/2018 23:52	Jeremy C Giffin	1
07105	Volatile Headspace Hydrocarbon	RSKSOP-175 modified	1	181830003A	07/02/2018 20:38	Johanna C Kennedy	1

**Sample Description:** MW-515-W-180628 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9684403  
**ELLE Group #:** 1961024  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submittal Date/Time:** 06/29/2018 10:40

**Collection Date/Time:** 06/28/2018 10:25

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	181860006A	07/10/2018 05:51	Amy Lehr	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	181860006A	07/05/2018 19:30	Kate E Lutte	1
06037	Manganese	EPA 200.8 rev 5.4	1	181830705005A	07/12/2018 19:50	Bradley M Berlot	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	181830705005	07/03/2018 05:08	James L Mertz	1
00368	Nitrate Nitrogen	EPA 300.0	1	18180987109B	06/30/2018 03:57	Clinton M Wilson	5
00228	Sulfate	EPA 300.0	1	18180987109B	06/30/2018 03:57	Clinton M Wilson	5

**Sample Description:** MW-516-W-180628 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9684404  
**ELLE Group #:** 1961024  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 06/29/2018 10:40

**Collection Date/Time:** 06/28/2018 11:20

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>					
<b>SW-846 8270C SIM</b>			<b>ug/l</b>	<b>ug/l</b>	
14243	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14243	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14243	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14243	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14243	Chrysene	218-01-9	N.D.	0.01	1
14243	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14243	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>					
<b>ECY 97-602 NWTPH-Gx</b>			<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	50	1
<b>GC Volatiles</b>					
<b>SW-846 8021B</b>			<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1
<b>GC Miscellaneous</b>					
<b>RSKSOP-175 modified</b>			<b>ug/l</b>	<b>ug/l</b>	
07105	Methane	74-82-8	27	3.0	1
<b>GC Petroleum Hydrocarbons w/Si</b>					
<b>ECY 97-602 NWTPH-Dx modified</b>			<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	48	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	110	1
<b>Metals Dissolved</b>					
<b>EPA 200.8 rev 5.4</b>			<b>ug/l</b>	<b>ug/l</b>	
06037	Manganese	7439-96-5	222	4.9	1
<b>Wet Chemistry</b>					
<b>EPA 300.0</b>			<b>ug/l</b>	<b>ug/l</b>	
00368	Nitrate Nitrogen	14797-55-8	N.D.	250	5
00228	Sulfate	14808-79-8	32,600	1,500	5

### Sample Comments

State of Washington Lab Certification No. C457  
This sample was field filtered for dissolved metals.  
Carcinogenic PAHs have been reported for this sample

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14243	SIM SVOAs 8270C MINI	SW-846 8270C SIM	1	18184WAK026	07/06/2018 23:22	Catherine E Bachman	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18184WAK026	07/05/2018 08:00	Logan M Brosemer	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18182A94A	07/03/2018 00:17	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18182A94A	07/03/2018 00:17	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18182A94A	07/03/2018 00:17	Jeremy C Giffin	1
07105	Volatile Headspace Hydrocarbon	RSKSOP-175 modified	1	181830003A	07/02/2018 20:55	Johanna C Kennedy	1

**Sample Description:** MW-516-W-180628 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9684404  
**ELLE Group #:** 1961024  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submittal Date/Time:** 06/29/2018 10:40

**Collection Date/Time:** 06/28/2018 11:20

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	181860006A	07/10/2018 06:15	Amy Lehr	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	181860006A	07/05/2018 19:30	Kate E Lutte	1
06037	Manganese	EPA 200.8 rev 5.4	1	181830705005A	07/12/2018 19:52	Bradley M Berlot	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	181830705005	07/03/2018 05:08	James L Mertz	1
00368	Nitrate Nitrogen	EPA 300.0	1	18180987109B	06/30/2018 04:15	Clinton M Wilson	5
00228	Sulfate	EPA 300.0	1	18180987109B	06/30/2018 04:15	Clinton M Wilson	5

**Sample Description:** MW-517-W-180628 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9684405  
**ELLE Group #:** 1961024  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 06/29/2018 10:40

**Collection Date/Time:** 06/28/2018 12:35

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>					
<b>SW-846 8270C SIM</b>			<b>ug/l</b>	<b>ug/l</b>	
14243	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14243	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14243	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14243	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14243	Chrysene	218-01-9	N.D.	0.01	1
14243	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14243	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>					
<b>ECY 97-602 NWTPH-Gx</b>			<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	50	1
<b>GC Volatiles</b>					
<b>SW-846 8021B</b>			<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1
<b>GC Miscellaneous</b>					
<b>RSKSOP-175 modified</b>			<b>ug/l</b>	<b>ug/l</b>	
07105	Methane	74-82-8	N.D.	3.0	1
<b>GC Petroleum Hydrocarbons w/Si</b>					
<b>ECY 97-602 NWTPH-Dx modified</b>			<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	47	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	110	1
<b>Metals Dissolved</b>					
<b>EPA 200.8 rev 5.4</b>			<b>ug/l</b>	<b>ug/l</b>	
06037	Manganese	7439-96-5	148	4.9	1
<b>Wet Chemistry</b>					
<b>EPA 300.0</b>			<b>ug/l</b>	<b>ug/l</b>	
00368	Nitrate Nitrogen	14797-55-8	310	250	5
00228	Sulfate	14808-79-8	25,700	1,500	5

### Sample Comments

State of Washington Lab Certification No. C457  
This sample was field filtered for dissolved metals.  
Carcinogenic PAHs have been reported for this sample

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14243	SIM SVOAs 8270C MINI	SW-846 8270C SIM	1	18184WAK026	07/06/2018 23:51	Catherine E Bachman	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18184WAK026	07/05/2018 08:00	Logan M Brosemer	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18182A94A	07/03/2018 00:42	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18182A94A	07/03/2018 00:42	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18182A94A	07/03/2018 00:42	Jeremy C Giffin	1
07105	Volatile Headspace Hydrocarbon	RSKSOP-175 modified	1	181830003A	07/02/2018 21:12	Johanna C Kennedy	1

**Sample Description:** MW-517-W-180628 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9684405  
**ELLE Group #:** 1961024  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submittal Date/Time:** 06/29/2018 10:40

**Collection Date/Time:** 06/28/2018 12:35

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	181860006A	07/10/2018 06:38	Amy Lehr	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	181860006A	07/05/2018 19:30	Kate E Lutte	1
06037	Manganese	EPA 200.8 rev 5.4	1	181830705005A	07/12/2018 19:54	Bradley M Berlot	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	181830705005	07/03/2018 05:08	James L Mertz	1
00368	Nitrate Nitrogen	EPA 300.0	1	18180987109B	06/30/2018 04:32	Clinton M Wilson	5
00228	Sulfate	EPA 300.0	1	18180987109B	06/30/2018 04:32	Clinton M Wilson	5

**Sample Description:** MW-518-W-180628 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9684406  
**ELLE Group #:** 1961024  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 06/29/2018 10:40

**Collection Date/Time:** 06/28/2018 12:50

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>					
		<b>SW-846 8270C SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14243	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14243	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14243	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14243	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14243	Chrysene	218-01-9	N.D.	0.01	1
14243	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14243	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>					
		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	690	50	1
<b>GC Volatiles</b>					
		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1
<b>GC Miscellaneous</b>					
		<b>RSKSOP-175 modified</b>	<b>ug/l</b>	<b>ug/l</b>	
07105	Methane	74-82-8	4,200	60	20
<b>GC Petroleum Hydrocarbons w/Si</b>					
		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	47	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1
<b>Metals Dissolved</b>					
		<b>EPA 200.8 rev 5.4</b>	<b>ug/l</b>	<b>ug/l</b>	
06037	Manganese	7439-96-5	215	4.9	1
<b>Wet Chemistry</b>					
		<b>EPA 300.0</b>	<b>ug/l</b>	<b>ug/l</b>	
00368	Nitrate Nitrogen	14797-55-8	N.D.	250	5
00228	Sulfate	14808-79-8	18,900	1,500	5

### Sample Comments

State of Washington Lab Certification No. C457  
This sample was field filtered for dissolved metals.  
Carcinogenic PAHs have been reported for this sample

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14243	SIM SVOAs 8270C MINI	SW-846 8270C SIM	1	18184WAK026	07/07/2018 00:19	Catherine E Bachman	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18184WAK026	07/05/2018 08:00	Logan M Brosemer	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18182A94A	07/03/2018 01:08	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18182A94A	07/03/2018 01:08	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18182A94A	07/03/2018 01:08	Jeremy C Giffin	1
07105	Volatile Headspace Hydrocarbon	RSKSOP-175 modified	1	181830003A	07/03/2018 17:35	Johanna C Kennedy	20



**Sample Description:** MW-518-W-180628 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9684406  
**ELLE Group #:** 1961024  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submittal Date/Time:** 06/29/2018 10:40

**Collection Date/Time:** 06/28/2018 12:50

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	181860006A	07/10/2018 07:02	Amy Lehr	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	181860006A	07/05/2018 19:30	Kate E Lutte	1
06037	Manganese	EPA 200.8 rev 5.4	1	181830705006A	07/12/2018 09:22	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	181830705006	07/03/2018 05:08	James L Mertz	1
00368	Nitrate Nitrogen	EPA 300.0	1	18180987109B	06/30/2018 04:50	Clinton M Wilson	5
00228	Sulfate	EPA 300.0	1	18180987109B	06/30/2018 04:50	Clinton M Wilson	5

**Sample Description:** MW-520-W-180628 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9684407  
**ELLE Group #:** 1961024  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 06/29/2018 10:40

**Collection Date/Time:** 06/28/2018 11:30

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>					
<b>SW-846 8270C SIM</b>			<b>ug/l</b>	<b>ug/l</b>	
14243	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14243	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14243	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14243	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14243	Chrysene	218-01-9	N.D.	0.01	1
14243	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14243	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>					
<b>ECY 97-602 NWTPH-Gx</b>			<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	50	1
<b>GC Volatiles</b>					
<b>SW-846 8021B</b>			<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1
<b>GC Miscellaneous</b>					
<b>RSKSOP-175 modified</b>			<b>ug/l</b>	<b>ug/l</b>	
07105	Methane	74-82-8	120	3.0	1
<b>GC Petroleum Hydrocarbons w/Si</b>					
<b>ECY 97-602 NWTPH-Dx modified</b>			<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	48	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	110	1
<b>Metals Dissolved</b>					
<b>EPA 200.8 rev 5.4</b>			<b>ug/l</b>	<b>ug/l</b>	
06037	Manganese	7439-96-5	1,110	4.9	1
<b>Wet Chemistry</b>					
<b>EPA 300.0</b>			<b>ug/l</b>	<b>ug/l</b>	
00368	Nitrate Nitrogen	14797-55-8	N.D.	250	5
00228	Sulfate	14808-79-8	38,300	1,500	5

### Sample Comments

State of Washington Lab Certification No. C457  
This sample was field filtered for dissolved metals.  
Carcinogenic PAHs have been reported for this sample

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14243	SIM SVOAs 8270C MINI	SW-846 8270C SIM	1	18184WAK026	07/07/2018 00:47	Catherine E Bachman	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18184WAK026	07/05/2018 08:00	Logan M Brosemer	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18182A94A	07/03/2018 01:33	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18182A94A	07/03/2018 01:33	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18182A94A	07/03/2018 01:33	Jeremy C Giffin	1
07105	Volatile Headspace Hydrocarbon	RSKSOP-175 modified	1	181830003A	07/02/2018 22:03	Johanna C Kennedy	1

**Sample Description:** MW-520-W-180628 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9684407  
**ELLE Group #:** 1961024  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submittal Date/Time:** 06/29/2018 10:40

**Collection Date/Time:** 06/28/2018 11:30

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	181860006A	07/10/2018 07:25	Amy Lehr	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	181860006A	07/05/2018 19:30	Kate E Lutte	1
06037	Manganese	EPA 200.8 rev 5.4	1	181830705006A	07/12/2018 09:23	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	181830705006	07/03/2018 05:08	James L Mertz	1
00368	Nitrate Nitrogen	EPA 300.0	1	18180987109B	06/30/2018 05:08	Clinton M Wilson	5
00228	Sulfate	EPA 300.0	1	18180987109B	06/30/2018 05:08	Clinton M Wilson	5

**Sample Description:** MW-521-W-180628 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9684408  
**ELLE Group #:** 1961024  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 06/29/2018 10:40

**Collection Date/Time:** 06/28/2018 12:30

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>					
<b>SW-846 8270C SIM</b>			<b>ug/l</b>	<b>ug/l</b>	
14243	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14243	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14243	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14243	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14243	Chrysene	218-01-9	N.D.	0.01	1
14243	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14243	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>					
<b>ECY 97-602 NWTPH-Gx</b>			<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	50	1
<b>GC Volatiles</b>					
<b>SW-846 8021B</b>			<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1
<b>GC Miscellaneous</b>					
<b>RSKSOP-175 modified</b>			<b>ug/l</b>	<b>ug/l</b>	
07105	Methane	74-82-8	75	3.0	1
<b>GC Petroleum Hydrocarbons w/Si</b>					
<b>ECY 97-602 NWTPH-Dx modified</b>			<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	48	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	110	1
<b>Metals Dissolved</b>					
<b>EPA 200.8 rev 5.4</b>			<b>ug/l</b>	<b>ug/l</b>	
06037	Manganese	7439-96-5	1,030	4.9	1
<b>Wet Chemistry</b>					
<b>EPA 300.0</b>			<b>ug/l</b>	<b>ug/l</b>	
00368	Nitrate Nitrogen	14797-55-8	N.D.	250	5
00228	Sulfate	14808-79-8	52,200	1,500	5

### Sample Comments

State of Washington Lab Certification No. C457  
This sample was field filtered for dissolved metals.  
Carcinogenic PAHs have been reported for this sample

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14243	SIM SVOAs 8270C MINI	SW-846 8270C SIM	1	18184WAK026	07/07/2018 01:16	Catherine E Bachman	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18184WAK026	07/05/2018 08:00	Logan M Brosemer	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18182A94A	07/03/2018 01:59	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18182A94A	07/03/2018 01:59	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18182A94A	07/03/2018 01:59	Jeremy C Giffin	1
07105	Volatile Headspace Hydrocarbon	RSKSOP-175 modified	1	181830003A	07/02/2018 22:20	Johanna C Kennedy	1

**Sample Description:** MW-521-W-180628 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9684408  
**ELLE Group #:** 1961024  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submittal Date/Time:** 06/29/2018 10:40

**Collection Date/Time:** 06/28/2018 12:30

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	181860006A	07/10/2018 07:48	Amy Lehr	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	181860006A	07/05/2018 19:30	Kate E Lutte	1
06037	Manganese	EPA 200.8 rev 5.4	1	181830705001A	07/05/2018 10:31	Patrick J Engle	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	181830705001	07/02/2018 15:30	JoElla L Rice	1
00368	Nitrate Nitrogen	EPA 300.0	1	18180987109B	06/30/2018 05:26	Clinton M Wilson	5
00228	Sulfate	EPA 300.0	1	18180987109B	06/30/2018 05:26	Clinton M Wilson	5

**Sample Description:** MW-522-W-180628 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9684409  
**ELLE Group #:** 1961024  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 06/29/2018 10:40  
**Collection Date/Time:** 06/28/2018 14:00

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>					
<b>SW-846 8270C SIM</b>			<b>ug/l</b>	<b>ug/l</b>	
14243	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14243	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14243	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14243	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14243	Chrysene	218-01-9	N.D.	0.01	1
14243	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14243	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>					
<b>ECY 97-602 NWTPH-Gx</b>			<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	50	1
<b>GC Volatiles</b>					
<b>SW-846 8021B</b>			<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1
<b>GC Miscellaneous</b>					
<b>RSKSOP-175 modified</b>			<b>ug/l</b>	<b>ug/l</b>	
07105	Methane	74-82-8	160	3.0	1
<b>GC Petroleum Hydrocarbons w/Si</b>					
<b>ECY 97-602 NWTPH-Dx modified</b>			<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	50	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	110	1
<b>Metals Dissolved</b>					
<b>EPA 200.8 rev 5.4</b>			<b>ug/l</b>	<b>ug/l</b>	
06037	Manganese	7439-96-5	786	4.9	1
<b>Wet Chemistry</b>					
<b>EPA 300.0</b>			<b>ug/l</b>	<b>ug/l</b>	
00368	Nitrate Nitrogen	14797-55-8	N.D.	250	5
00228	Sulfate	14808-79-8	71,600	1,500	5

### Sample Comments

State of Washington Lab Certification No. C457  
This sample was field filtered for dissolved metals.  
Carcinogenic PAHs have been reported for this sample

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14243	SIM SVOAs 8270C MINI	SW-846 8270C SIM	1	18184WAK026	07/07/2018 01:44	Catherine E Bachman	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18184WAK026	07/05/2018 08:00	Logan M Brosemer	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18182A94A	07/03/2018 02:24	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18182A94A	07/03/2018 02:24	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18182A94A	07/03/2018 02:24	Jeremy C Giffin	1
07105	Volatile Headspace Hydrocarbon	RSKSOP-175 modified	1	181830003A	07/02/2018 22:37	Johanna C Kennedy	1

**Sample Description:** MW-522-W-180628 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9684409  
**ELLE Group #:** 1961024  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submittal Date/Time:** 06/29/2018 10:40

**Collection Date/Time:** 06/28/2018 14:00

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	181860006A	07/10/2018 08:12	Amy Lehr	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	181860006A	07/05/2018 19:30	Kate E Lutte	1
06037	Manganese	EPA 200.8 rev 5.4	1	181830705001A	07/05/2018 10:33	Patrick J Engle	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	181830705001	07/02/2018 15:30	JoElla L Rice	1
00368	Nitrate Nitrogen	EPA 300.0	1	18180987109B	06/30/2018 05:43	Clinton M Wilson	5
00228	Sulfate	EPA 300.0	1	18180987109B	06/30/2018 05:43	Clinton M Wilson	5

**Sample Description:** DUP-2-WD-180628 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9684410  
**ELLE Group #:** 1961024  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 06/29/2018 10:40

**Collection Date/Time:** 06/28/2018

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>					
<b>SW-846 8270C SIM</b>			<b>ug/l</b>	<b>ug/l</b>	
14243	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14243	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14243	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14243	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14243	Chrysene	218-01-9	N.D.	0.01	1
14243	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14243	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>					
<b>ECY 97-602 NWTPH-Gx</b>			<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	50	1
<b>GC Volatiles</b>					
<b>SW-846 8021B</b>			<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1
<b>GC Miscellaneous</b>					
<b>RSKSOP-175 modified</b>			<b>ug/l</b>	<b>ug/l</b>	
07105	Methane	74-82-8	42	3.0	1
<b>GC Petroleum Hydrocarbons w/Si</b>					
<b>ECY 97-602 NWTPH-Dx modified</b>			<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	49	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	110	1
<b>Metals Dissolved</b>					
<b>EPA 200.8 rev 5.4</b>			<b>ug/l</b>	<b>ug/l</b>	
06037	Manganese	7439-96-5	42.5	4.9	1
<b>Wet Chemistry</b>					
<b>EPA 300.0</b>			<b>ug/l</b>	<b>ug/l</b>	
00368	Nitrate Nitrogen	14797-55-8	N.D.	250	5
00228	Sulfate	14808-79-8	22,500	1,500	5

### Sample Comments

State of Washington Lab Certification No. C457  
This sample was field filtered for dissolved metals.  
Carcinogenic PAHs have been reported for this sample

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14243	SIM SVOAs 8270C MINI	SW-846 8270C SIM	1	18184WAK026	07/07/2018 02:13	Catherine E Bachman	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18184WAK026	07/05/2018 08:00	Logan M Brosemer	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18186A94A	07/06/2018 22:26	Marie D Beamenderfer	1
02102	Method 8021 Water Master	SW-846 8021B	1	18186A94A	07/06/2018 22:26	Marie D Beamenderfer	1
01146	GC VOA Water Prep	SW-846 5030B	1	18186A94A	07/06/2018 22:26	Marie D Beamenderfer	1
07105	Volatile Headspace Hydrocarbon	RSKSOP-175 modified	1	181830003A	07/02/2018 22:53	Johanna C Kennedy	1



**Sample Description:** DUP-2-WD-180628 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9684410  
**ELLE Group #:** 1961024  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submittal Date/Time:** 06/29/2018 10:40  
**Collection Date/Time:** 06/28/2018

## Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	181860006A	07/10/2018 08:35	Amy Lehr	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	181860006A	07/05/2018 19:30	Kate E Lutte	1
06037	Manganese	EPA 200.8 rev 5.4	1	181830705001A	07/05/2018 10:34	Patrick J Engle	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	181830705001	07/02/2018 15:30	JoElla L Rice	1
00368	Nitrate Nitrogen	EPA 300.0	1	18180987109B	06/29/2018 22:20	Clinton M Wilson	5
00228	Sulfate	EPA 300.0	1	18180987109B	06/29/2018 22:20	Clinton M Wilson	5

**Sample Description:** DUP-3-WD-180628 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9684411  
**ELLE Group #:** 1961024  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 06/29/2018 10:40  
**Collection Date/Time:** 06/28/2018

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>					
<b>SW-846 8270C SIM</b>			<b>ug/l</b>	<b>ug/l</b>	
14243	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14243	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14243	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14243	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14243	Chrysene	218-01-9	N.D.	0.01	1
14243	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14243	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>					
<b>ECY 97-602 NWTPH-Gx</b>			<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	50	1
<b>GC Volatiles</b>					
<b>SW-846 8021B</b>			<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1
<b>GC Miscellaneous</b>					
<b>RSKSOP-175 modified</b>			<b>ug/l</b>	<b>ug/l</b>	
07105	Methane	74-82-8	140	3.0	1
<b>GC Petroleum Hydrocarbons w/Si</b>					
<b>ECY 97-602 NWTPH-Dx modified</b>			<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	49	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	110	1
<b>Metals Dissolved</b>					
<b>EPA 200.8 rev 5.4</b>			<b>ug/l</b>	<b>ug/l</b>	
06037	Manganese	7439-96-5	584	4.9	1
<b>Wet Chemistry</b>					
<b>EPA 300.0</b>			<b>ug/l</b>	<b>ug/l</b>	
00368	Nitrate Nitrogen	14797-55-8	N.D.	250	5
00228	Sulfate	14808-79-8	33,500	1,500	5

### Sample Comments

State of Washington Lab Certification No. C457  
This sample was field filtered for dissolved metals.  
Carcinogenic PAHs have been reported for this sample

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14243	SIM SVOAs 8270C MINI	SW-846 8270C SIM	1	18184WAL026	07/06/2018 02:17	Catherine E Bachman	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18184WAL026	07/05/2018 08:00	Logan M Brosemer	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18186A94A	07/06/2018 22:52	Marie D Beamenderfer	1
02102	Method 8021 Water Master	SW-846 8021B	1	18186A94A	07/06/2018 22:52	Marie D Beamenderfer	1
01146	GC VOA Water Prep	SW-846 5030B	1	18186A94A	07/06/2018 22:52	Marie D Beamenderfer	1
07105	Volatile Headspace Hydrocarbon	RSKSOP-175 modified	1	181830003A	07/02/2018 23:10	Johanna C Kennedy	1

**Sample Description:** DUP-3-WD-180628 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9684411  
**ELLE Group #:** 1961024  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submittal Date/Time:** 06/29/2018 10:40

**Collection Date/Time:** 06/28/2018

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	181860006A	07/10/2018 08:59	Amy Lehr	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	181860006A	07/05/2018 19:30	Kate E Lutte	1
06037	Manganese	EPA 200.8 rev 5.4	1	181830705001A	07/05/2018 10:36	Patrick J Engle	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	181830705001	07/02/2018 15:30	JoElla L Rice	1
00368	Nitrate Nitrogen	EPA 300.0	1	18180987117A	06/29/2018 22:17	Clinton M Wilson	5
00228	Sulfate	EPA 300.0	1	18180987117A	06/29/2018 22:17	Clinton M Wilson	5

**Sample Description:** DUP-4-WD-180628 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9684412  
**ELLE Group #:** 1961024  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 06/29/2018 10:40  
**Collection Date/Time:** 06/28/2018

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>					
<b>SW-846 8270C SIM</b>			<b>ug/l</b>	<b>ug/l</b>	
14243	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14243	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14243	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14243	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14243	Chrysene	218-01-9	N.D.	0.01	1
14243	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14243	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>					
<b>ECY 97-602 NWTPH-Gx</b>			<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	630	50	1
<b>GC Volatiles</b>					
<b>SW-846 8021B</b>			<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1
<b>GC Miscellaneous</b>					
<b>RSKSOP-175 modified</b>			<b>ug/l</b>	<b>ug/l</b>	
07105	Methane	74-82-8	4,000	60	20
<b>GC Petroleum Hydrocarbons w/Si</b>					
<b>ECY 97-602 NWTPH-Dx modified</b>			<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	47	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	110	1
<b>Trial ID: RE</b>					
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	47	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1
<p>The recovery for a target analyte(s) in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary. The following action was taken: The sample was re-extracted outside the method required holding time and the LCS is compliant. The recovery for the method blank surrogate(s) is outside the QC acceptance limits as noted on the QC Summary in the second trial. Both trials are reported.</p>					
<b>Metals Dissolved</b>					
<b>EPA 200.8 rev 5.4</b>			<b>ug/l</b>	<b>ug/l</b>	
06037	Manganese	7439-96-5	213	4.9	1
<b>Wet Chemistry</b>					
<b>EPA 300.0</b>			<b>ug/l</b>	<b>ug/l</b>	
00368	Nitrate Nitrogen	14797-55-8	N.D.	250	5
00228	Sulfate	14808-79-8	23,600	1,500	5

### Sample Comments

State of Washington Lab Certification No. C457  
This sample was field filtered for dissolved metals.  
Carcinogenic PAHs have been reported for this sample

**Sample Description:** DUP-4-WD-180628 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9684412  
**ELLE Group #:** 1961024  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 06/29/2018 10:40

**Collection Date/Time:** 06/28/2018

## Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14243	SIM SVOAs 8270C MINI	SW-846 8270C SIM	1	18184WAL026	07/06/2018 02:46	Catherine E Bachman	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18184WAL026	07/05/2018 08:00	Logan M Brosemer	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18186A94A	07/06/2018 23:17	Marie D Beamenderfer	1
02102	Method 8021 Water Master	SW-846 8021B	1	18186A94A	07/06/2018 23:17	Marie D Beamenderfer	1
01146	GC VOA Water Prep	SW-846 5030B	1	18186A94A	07/06/2018 23:17	Marie D Beamenderfer	1
07105	Volatile Headspace Hydrocarbon	RSKSOP-175 modified	1	181830003A	07/03/2018 18:09	Johanna C Kennedy	20
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	181860007A	07/11/2018 11:54	Thomas C Wildermuth	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	2-RE	181930030A	07/19/2018 00:55	Thomas C Wildermuth	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	181860007A	07/05/2018 21:29	Kate E Lutte	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	2	181930030A	07/13/2018 16:00	Oswaldo R Sanchez	1
06037	Manganese	EPA 200.8 rev 5.4	1	181830705001A	07/05/2018 10:38	Patrick J Engle	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	181830705001	07/02/2018 15:30	JoElla L Rice	1
00368	Nitrate Nitrogen	EPA 300.0	1	18180987109B	06/29/2018 22:38	Clinton M Wilson	5
00228	Sulfate	EPA 300.0	1	18180987109B	06/29/2018 22:38	Clinton M Wilson	5

**Sample Description:** Trip Blank-T-180628 NA Water  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9684413  
**ELLE Group #:** 1961024  
**Matrix:** Water

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 06/29/2018 10:40  
**Collection Date/Time:** 06/28/2018

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC Volatiles</b>					
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx n.a.	ug/l N.D.	ug/l 50	1
<b>GC Volatiles</b>					
02102	Benzene	SW-846 8021B 71-43-2	ug/l N.D.	ug/l 0.5	1

### Sample Comments

State of Washington Lab Certification No. C457

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18186A94A	07/06/2018 19:28	Marie D Beamenderfer	1
02102	Method 8021 Water Master	SW-846 8021B	1	18186A94A	07/06/2018 19:28	Marie D Beamenderfer	1
01146	GC VOA Water Prep	SW-846 5030B	1	18186A94A	07/06/2018 19:28	Marie D Beamenderfer	1

## Quality Control Summary

Client Name: Chevron Environmental Mgmt Co  
Reported: 07/26/2018 13:26

Group Number: 1961024

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

### Method Blank

Analysis Name	Result ug/l	MDL ug/l
Batch number: 18184WAK026	Sample number(s): 9684389-9684398,9684400-9684410	
Benzo(a)anthracene	N.D.	0.01
Benzo(a)pyrene	N.D.	0.01
Benzo(b)fluoranthene	N.D.	0.01
Benzo(k)fluoranthene	N.D.	0.01
Chrysene	N.D.	0.01
Dibenz(a,h)anthracene	N.D.	0.02
Indeno(1,2,3-cd)pyrene	N.D.	0.01
Batch number: 18184WAL026	Sample number(s): 9684411-9684412	
Benzo(a)anthracene	N.D.	0.01
Benzo(a)pyrene	N.D.	0.01
Benzo(b)fluoranthene	N.D.	0.01
Benzo(k)fluoranthene	N.D.	0.01
Chrysene	N.D.	0.01
Dibenz(a,h)anthracene	N.D.	0.02
Indeno(1,2,3-cd)pyrene	N.D.	0.01
Batch number: 18182A94A	Sample number(s): 9684389-9684398,9684400-9684409	
Benzene	N.D.	0.2
NWTPH-Gx water C7-C12	N.D.	50
Batch number: 18186A94A	Sample number(s): 9684410-9684413	
Benzene	N.D.	0.2
NWTPH-Gx water C7-C12	N.D.	50
Batch number: 181830002A	Sample number(s): 9684389-9684398,9684400	
Methane	N.D.	3.0
Batch number: 181830003A	Sample number(s): 9684401-9684412	
Methane	N.D.	3.0
Batch number: 181840030A	Sample number(s): 9684389-9684398,9684400-9684401	
DX DRO C12-C24 w/ SiGel	N.D.	45
DX HRO C24-C40 w/ SiGel	N.D.	100
Batch number: 181860006A	Sample number(s): 9684402-9684411	
DX DRO C12-C24 w/ SiGel	N.D.	45
DX HRO C24-C40 w/ SiGel	N.D.	100
Batch number: 181860007A	Sample number(s): 9684412	
DX DRO C12-C24 w/ SiGel	N.D.	45
DX HRO C24-C40 w/ SiGel	N.D.	100

\*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

## Quality Control Summary

Client Name: Chevron Environmental Mgmt Co  
Reported: 07/26/2018 13:26

Group Number: 1961024

### Method Blank (continued)

Analysis Name	Result ug/l	MDL ug/l
Batch number: 181930005A	Sample number(s): 9684401	
DX DRO C12-C24 w/ SiGel	N.D.	45
DX HRO C24-C40 w/ SiGel	N.D.	100
Batch number: 181930030A	Sample number(s): 9684412	
DX DRO C12-C24 w/ SiGel	N.D.	45
DX HRO C24-C40 w/ SiGel	N.D.	100
Batch number: 181830705001A	Sample number(s): 9684389-9684391,9684408-9684412	
Manganese	N.D.	4.9
Batch number: 181830705005A	Sample number(s): 9684392-9684397,9684399-9684401,9684403-9684405	
Manganese	N.D.	4.9
Batch number: 181830705006A	Sample number(s): 9684402,9684406-9684407	
Manganese	N.D.	4.9
Batch number: 18180987109A	Sample number(s): 9684389-9684397,9684399-9684401	
Nitrate Nitrogen	N.D.	50
Sulfate	N.D.	300
Batch number: 18180987109B	Sample number(s): 9684402-9684410,9684412	
Nitrate Nitrogen	N.D.	50
Sulfate	N.D.	300
Batch number: 18180987117A	Sample number(s): 9684411	
Nitrate Nitrogen	N.D.	50
Sulfate	N.D.	300

### LCS/LCSD

Analysis Name	LCS Spike Added ug/l	LCS Conc ug/l	LCSD Spike Added ug/l	LCSD Conc ug/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: 18184WAK026	Sample number(s): 9684389-9684398,9684400-9684410								
Benzo(a)anthracene	1.00	0.833			83		65-129		
Benzo(a)pyrene	1.00	0.860			86		65-126		
Benzo(b)fluoranthene	1.00	0.926			93		65-136		
Benzo(k)fluoranthene	1.00	0.829			83		65-131		
Chrysene	1.00	0.786			79		62-129		
Dibenz(a,h)anthracene	1.00	0.773			77		50-139		
Indeno(1,2,3-cd)pyrene	1.00	0.745			75		52-133		
Batch number: 18184WAL026	Sample number(s): 9684411-9684412								
Benzo(a)anthracene	1.00	0.857			86		65-129		
Benzo(a)pyrene	1.00	0.861			86		65-126		

\*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.



## Quality Control Summary

Client Name: Chevron Environmental Mgmt Co  
Reported: 07/26/2018 13:26

Group Number: 1961024

### LCS/LCSD (continued)

Analysis Name	LCS Spike Added ug/l	LCS Conc ug/l	LCSD Spike Added ug/l	LCSD Conc ug/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Benzo(b)fluoranthene	1.00	0.944			94		65-136		
Benzo(k)fluoranthene	1.00	0.811			81		65-131		
Chrysene	1.00	0.772			77		62-129		
Dibenz(a,h)anthracene	1.00	0.795			79		50-139		
Indeno(1,2,3-cd)pyrene	1.00	0.778			78		52-133		
	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>					
Batch number: 18182A94A	Sample number(s): 9684389-9684398,9684400-9684409								
Benzene	20	19.57			98		80-120		
NWTPH-Gx water C7-C12	1100	1263.21			115		80-120		
	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>					
Batch number: 18186A94A	Sample number(s): 9684410-9684413								
Benzene	20	20.53			103		80-120		
NWTPH-Gx water C7-C12	1100	1313.49			119		80-120		
	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>					
Batch number: 181830002A	Sample number(s): 9684389-9684398,9684400								
Methane	59.8	60.22			101		85-115		
	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>					
Batch number: 181830003A	Sample number(s): 9684401-9684412								
Methane	59.8	61.92			104		85-115		
	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>					
Batch number: 181840030A	Sample number(s): 9684389-9684398,9684400-9684401								
DX DRO C12-C24 w/ SiGel	600	249			41		30-115		
	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>					
Batch number: 181860006A	Sample number(s): 9684402-9684411								
DX DRO C12-C24 w/ SiGel	600	237.93	600	195.32	40	33	30-115	20	20
	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>					
Batch number: 181860007A	Sample number(s): 9684412								
DX DRO C12-C24 w/ SiGel	600	167.53			28*		30-115		
	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>					
Batch number: 181930005A	Sample number(s): 9684401								
DX DRO C12-C24 w/ SiGel	600	210.51	600	174.74	35	29*	30-115	19	20
	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>					
Batch number: 181930030A	Sample number(s): 9684412								
DX DRO C12-C24 w/ SiGel	600	211.53			35		30-115		
	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>					
Batch number: 181830705001A	Sample number(s): 9684389-9684391,9684408-9684412								
Manganese	50	50.25			101		85-115		
	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>					
Batch number: 181830705005A	Sample number(s): 9684392-9684397,9684399-9684401,9684403-9684405								
Manganese	50	50.29			101		85-115		
	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>					
Batch number: 181830705006A	Sample number(s): 9684402,9684406-9684407								
Manganese	50	53.49			107		85-115		
	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>					

\*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

## Quality Control Summary

Client Name: Chevron Environmental Mgmt Co  
Reported: 07/26/2018 13:26

Group Number: 1961024

### LCS/LCSD (continued)

Analysis Name	LCS Spike Added ug/l	LCS Conc ug/l	LCSD Spike Added ug/l	LCSD Conc ug/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: 18180987109A	Sample number(s): 9684389-9684397,9684399-9684401								
Nitrate Nitrogen	750	770.73			103		90-110		
Sulfate	7500	7813.54			104		90-110		
Batch number: 18180987109B	Sample number(s): 9684402-9684410,9684412								
Nitrate Nitrogen	750	770.73			103		90-110		
Sulfate	7500	7813.54			104		90-110		
Batch number: 18180987117A	Sample number(s): 9684411								
Nitrate Nitrogen	750	768.26			102		90-110		
Sulfate	7500	7451.87			99		90-110		

### MS/MSD

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc ug/l	MS Spike Added ug/l	MS Conc ug/l	MSD Spike Added ug/l	MSD Conc ug/l	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Batch number: 18184WAK026	Sample number(s): 9684389-9684398,9684400-9684410 UNSPK: 9684396									
Benzo(a)anthracene	N.D.	1.11	0.963	1.07	0.907	87	85	65-129	6	30
Benzo(a)pyrene	N.D.	1.11	0.449	1.07	0.504	41*	47*	65-126	11	30
Benzo(b)fluoranthene	N.D.	1.11	0.929	1.07	0.891	84	83	65-136	4	30
Benzo(k)fluoranthene	N.D.	1.11	0.810	1.07	0.776	73	72	65-131	4	30
Chrysene	N.D.	1.11	0.825	1.07	0.794	75	74	62-129	4	30
Dibenz(a,h)anthracene	N.D.	1.11	0.761	1.07	0.716	69	67	50-139	6	30
Indeno(1,2,3-cd)pyrene	N.D.	1.11	0.731	1.07	0.688	66	64	52-133	6	30
Batch number: 18182A94A	Sample number(s): 9684389-9684398,9684400-9684409 UNSPK: 9684396									
Benzene	N.D.	20	21	20	20.85	105	104	80-120	1	30
NWTPH-Gx water C7-C12	N.D.	1100	1390.54	1100	1407.37	126*	128*	80-120	1	30
Batch number: 181830002A	Sample number(s): 9684389-9684398,9684400 UNSPK: 9684396									
Methane	12.39	59.8	58.85	59.8	66.22	78	90	73-125	12	30
Batch number: 181840030A	Sample number(s): 9684389-9684398,9684400-9684401 UNSPK: 9684396									
DX DRO C12-C24 w/ SiGel	N.D.	620	189.59	612	201.1	31	33	30-115	6	20

\*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

## Quality Control Summary

Client Name: Chevron Environmental Mgmt Co  
Reported: 07/26/2018 13:26

Group Number: 1961024

### MS/MSD (continued)

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc ug/l	MS Spike Added ug/l	MS Conc ug/l	MSD Spike Added ug/l	MSD Conc ug/l	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Batch number: 181830705001A Manganese	128.89	50	181.87			106		70-130		
Batch number: 181830705005A Manganese	168.48	50	226.8			117		70-130		
Batch number: 18180987109A Nitrate Nitrogen	N.D.	2500	2663.81			107		90-110		
Sulfate	73115.59	25000	102960.26			119*		90-110		
Batch number: 18180987109B Nitrate Nitrogen	282.11	2500	3034.65			110		90-110		
Sulfate	23121.72	25000	50687.71			110		90-110		

### Laboratory Duplicate

Background (BKG) = the sample used in conjunction with the duplicate

Analysis Name	BKG Conc ug/l	DUP Conc ug/l	DUP RPD	DUP RPD Max
Batch number: 181830705001A Manganese	128.89	130.64	1	20
Batch number: 181830705005A Manganese	168.48	170.64	1	20
Batch number: 18180987109A Nitrate Nitrogen	N.D.	N.D.	0 (1)	15
Sulfate	73115.59	85752.83	16*	15
Batch number: 18180987109B Nitrate Nitrogen	282.11	345.98	20* (1)	15
Sulfate	23121.72	23341.52	1 (1)	15

\*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

## Quality Control Summary

Client Name: Chevron Environmental Mgmt Co  
Reported: 07/26/2018 13:26

Group Number: 1961024

### Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: SIM SVOAs 8270C MINI

Batch number: 18184WAK026

	Fluoranthene-d10	Benzo(a)pyrene-d12	1-Methylnaphthalene-d10
9684389	71	53	65
9684390	80	64	59
9684391	65	68	68
9684392	62	53	67
9684393	63	50	63
9684394	67	56	61
9684395	63	72	67
9684396	78	26	69
9684397	73	36	76
9684398	75	40	73
9684400	70	60	68
9684401	67	32	68
9684402	65	31	71
9684403	73	48	69
9684404	83	51	73
9684405	83	39	71
9684406	81	46	71
9684407	75	51	68
9684408	69	49	71
9684409	64	49	67
9684410	60	53	67
Blank	87	68	72
LCS	86	77	73
MS	73	36	76
MSD	75	40	73

Limits: 43-130 23-144 31-121

Analysis Name: SIM SVOAs 8270C MINI

Batch number: 18184WAL026

	Fluoranthene-d10	Benzo(a)pyrene-d12	1-Methylnaphthalene-d10
9684411	80	70	65
9684412	67	53	66
Blank	81	67	67
LCS	84	77	76

Limits: 43-130 23-144 31-121

Analysis Name: Method 8021 Water Master

Batch number: 18182A94A

\*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

## Quality Control Summary

Client Name: Chevron Environmental Mgmt Co  
Reported: 07/26/2018 13:26

Group Number: 1961024

### Surrogate Quality Control (continued)

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: Method 8021 Water Master  
Batch number: 18182A94A

	Trifluorotoluene-P	Trifluorotoluene-F
9684389	82	79
9684390	83	80
9684391	82	80
9684392	82	82
9684393	82	80
9684394	83	83
9684395	83	80
9684396	83	80
9684397	81	97
9684398	81	99
9684400	82	81
9684401	82	80
9684402	83	80
9684403	83	80
9684404	82	81
9684405	83	80
9684406	82	79
9684407	83	81
9684408	83	81
9684409	83	81
Blank	83	81
LCS	81	94
MS	81	97
MSD	81	99
Limits:	51-120	50-150

Analysis Name: Method 8021 Water Master  
Batch number: 18186A94A

	Trifluorotoluene-P	Trifluorotoluene-F
9684410	83	80
9684411	83	79
9684412	82	78
9684413	83	80
Blank	83	84
LCS	82	97
Limits:	51-120	50-150

Analysis Name: Volatile Headspace Hydrocarbon  
Batch number: 181830002A

\*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

## Quality Control Summary

Client Name: Chevron Environmental Mgmt Co  
Reported: 07/26/2018 13:26

Group Number: 1961024

### Surrogate Quality Control (continued)

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: Volatile Headspace Hydrocarbon  
Batch number: 181830002A

	Propene
9684389	97
9684390	96
9684391	88
9684392	87
9684393	85
9684394	93
9684395	84
9684396	66
9684397	80
9684398	91
9684400	88
Blank	101
LCS	96
MS	80
MSD	91

Limits: 57-128

Analysis Name: Volatile Headspace Hydrocarbon  
Batch number: 181830003A

	Propene
9684401	82
9684402	91
9684403	90
9684404	92
9684405	89
9684406	91
9684407	88
9684408	96
9684409	86
9684410	91
9684411	87
9684412	91
Blank	100
LCS	96

Limits: 57-128

Analysis Name: NWTPH-Dx water w/Si Gel  
Batch number: 181840030A

	Orthoterphenyl	Capric Acid
9684389	73	0

\*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

## Quality Control Summary

Client Name: Chevron Environmental Mgmt Co  
Reported: 07/26/2018 13:26

Group Number: 1961024

### Surrogate Quality Control (continued)

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: NWTPH-Dx water w/Si Gel

Batch number: 181840030A

	Orthoterphenyl	Capric Acid
9684390	74	0
9684391	69	0
9684392	69	0
9684393	72	0
9684394	67	0
9684395	57	0
9684396	67	0
9684397	58	0
9684398	67	0
9684400	59	0
9684401	48*	0
Blank	85	0
LCS	78	0
MS	58	0
MSD	67	0
Limits:	50-150	0-1

Analysis Name: NWTPH-Dx water w/Si Gel

Batch number: 181860006A

	Orthoterphenyl	Capric Acid
9684402	65	0
9684403	68	0
9684404	63	0
9684405	67	0
9684406	57	0
9684407	63	0
9684408	54	0
9684409	68	0
9684410	65	0
9684411	64	0
Blank	62	0
LCS	62	0
LCSD	54	0
Limits:	50-150	0-1

Analysis Name: NWTPH-Dx water w/Si Gel

Batch number: 181860007A

	Orthoterphenyl	Capric Acid
9684412	60	0
Blank	65	0

\*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

## Quality Control Summary

Client Name: Chevron Environmental Mgmt Co  
Reported: 07/26/2018 13:26

Group Number: 1961024

### Surrogate Quality Control (continued)

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: NWTPH-Dx water w/Si Gel

Batch number: 181860007A

	Orthoterphenyl	Capric Acid
LCS	53	0
Limits:	50-150	0-1

Analysis Name: NWTPH-Dx water w/Si Gel

Batch number: 181930005A

	Orthoterphenyl	Capric Acid
9684401RE	65	0
Blank	55	0
LCS	65	0
LCSD	61	0
Limits:	50-150	0-1

Analysis Name: NWTPH-Dx water w/Si Gel

Batch number: 181930030A

	Orthoterphenyl	Capric Acid
9684412RE	67	0
Blank	49*	0
LCS	55	0
Limits:	50-150	0-1

\*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.



# Chevron Northwest Region Analysis Request/Chain of Custody



**Lancaster  
Laboratories**

Acct. # 119604

For Lancaster Laboratories use only  
Group # 1961024 Sample # 9684389-413

Instructions on reverse side correspond with circled numbers.

1 Client Information			4 Matrix			5 Analyses Requested										6 Remarks																																																																																																																																																																																																																																																																																																																																																																																													
Facility # <u>Edmonds Terminal</u> WBS <u>NWENUPM6001430802</u> Site Address <u>11720 unoco Rd, Edmonds, WA</u> Chevron PM <u>Kim Jolitz</u> Lead Consultant <u>Arcadis</u> Consultant/Office <u>1100 Olive way, suite 800, Seattle WA 98101</u> Consultant Project Mgr. <u>Scott Eorn</u> Consultant Phone # _____			Sediment <input type="checkbox"/> <input checked="" type="checkbox"/> Ground <input type="checkbox"/> Surface <input type="checkbox"/> Potable <input type="checkbox"/> NPDES <input type="checkbox"/> Air <input type="checkbox"/> Water _____ Oil _____			Total Number of Containers _____ BTEX-MTBE <input type="checkbox"/> 8021 <input checked="" type="checkbox"/> 8260 <input type="checkbox"/> Naphth _____ 8260 full scan _____ Oxygenates _____ NWTPH GX _____ NWTPH DX <input type="checkbox"/> Silica Gel Cleanup <input checked="" type="checkbox"/> Lead Total <input type="checkbox"/> Diss. <input type="checkbox"/> Method _____ WAVPH <input type="checkbox"/> WAEPH <input type="checkbox"/> CPMS by USEPA 8270 SIM _____ Sulfate, Nitrate USEPA 300.0 _____ Dissolved methane USEPA 15K 175 _____ Dissolved manganese USEPA 200.8 _____										SCR #: _____ <input type="checkbox"/> Results in Dry Weight <input type="checkbox"/> J value reporting needed <input type="checkbox"/> Must meet lowest detection limits possible for 8260 compounds <input type="checkbox"/> 8021 MTBE Confirmation <input type="checkbox"/> Confirm MTBE + Naphthalene <input type="checkbox"/> Confirm highest hit by 8260 <input type="checkbox"/> Confirm all hits by 8260 <input type="checkbox"/> Run _____ oxy's on highest hit <input type="checkbox"/> Run _____ oxy's on all hits																																																																																																																																																																																																																																																																																																																																																																																													
2 Sample Identification Sampler <u>Eric Krueger, Jason Lottle, Peabrick Collins, Alex Pink</u>			3 Collected Date Time Grab Composite <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Sample ID</th> <th>Date</th> <th>Time</th> <th>Grab</th> <th>Composite</th> <th>Soil</th> <th>Water</th> <th>Oil</th> <th>Total Containers</th> <th>BTEX-MTBE</th> <th>8021</th> <th>8260</th> <th>Naphth</th> <th>Oxygenates</th> <th>NWTPH GX</th> <th>NWTPH DX</th> <th>Silica Gel Cleanup</th> <th>Lead</th> <th>Total</th> <th>Diss.</th> <th>Method</th> <th>WAVPH</th> <th>WAEPH</th> <th>CPMS by USEPA 8270 SIM</th> <th>Sulfate, Nitrate USEPA 300.0</th> <th>Dissolved methane USEPA 15K 175</th> <th>Dissolved manganese USEPA 200.8</th> </tr> </thead> <tbody> <tr><td>MW-101</td><td>6/28/18</td><td>1135</td><td></td><td></td><td></td><td></td><td></td><td>  </td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>MW-139R</td><td></td><td>1125</td><td></td><td></td><td></td><td></td><td></td><td>  </td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>MW-503</td><td></td><td>0900</td><td></td><td></td><td></td><td></td><td></td><td>  </td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>MW-504</td><td></td><td>1020</td><td></td><td></td><td></td><td></td><td></td><td>  </td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>MW-505</td><td></td><td>1050</td><td></td><td></td><td></td><td></td><td></td><td>  </td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>MW-506</td><td></td><td>0940</td><td></td><td></td><td></td><td></td><td></td><td>  </td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>MW-507</td><td></td><td>0830</td><td></td><td></td><td></td><td></td><td></td><td>  </td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>MW-509</td><td></td><td>0835</td><td></td><td></td><td></td><td></td><td></td><td>  </td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>MW-509 MS</td><td></td><td>0835</td><td></td><td></td><td></td><td></td><td></td><td>  </td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>MW-509 MSD</td><td></td><td>0835</td><td></td><td></td><td></td><td></td><td></td><td>  </td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>MW-512</td><td></td><td>0840</td><td></td><td></td><td></td><td></td><td></td><td>  </td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>MW-513</td><td></td><td>1040</td><td></td><td></td><td></td><td></td><td></td><td>  </td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>MW-514</td><td>∇</td><td>0950</td><td>∇</td><td></td><td></td><td></td><td></td><td>  </td><td>∇</td><td></td><td></td><td></td><td></td><td>∇</td><td>∇</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>∇</td><td>∇</td><td>∇</td><td>∇</td><td></td></tr> </tbody> </table>			Sample ID	Date	Time	Grab	Composite	Soil	Water	Oil	Total Containers	BTEX-MTBE	8021	8260	Naphth	Oxygenates	NWTPH GX	NWTPH DX	Silica Gel Cleanup	Lead	Total	Diss.	Method	WAVPH	WAEPH	CPMS by USEPA 8270 SIM	Sulfate, Nitrate USEPA 300.0	Dissolved methane USEPA 15K 175	Dissolved manganese USEPA 200.8	MW-101	6/28/18	1135																									MW-139R		1125																										MW-503		0900																										MW-504		1020																										MW-505		1050																										MW-506		0940																										MW-507		0830																										MW-509		0835																										MW-509 MS		0835																										MW-509 MSD		0835																										MW-512		0840																										MW-513		1040																										MW-514	∇	0950	∇						∇					∇	∇								∇	∇	∇	∇		* Standard Silica Gel cleanup * Dissolved manganese field filtered	
Sample ID	Date	Time	Grab	Composite	Soil	Water	Oil	Total Containers	BTEX-MTBE	8021	8260	Naphth	Oxygenates	NWTPH GX	NWTPH DX	Silica Gel Cleanup	Lead	Total	Diss.	Method	WAVPH	WAEPH	CPMS by USEPA 8270 SIM	Sulfate, Nitrate USEPA 300.0	Dissolved methane USEPA 15K 175	Dissolved manganese USEPA 200.8																																																																																																																																																																																																																																																																																																																																																																																			
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7 Turnaround Time Requested (TAT) (please circle) Standard 5 day 4 day 72 hour 48 hour 24 hour			Relinquished by <u>[Signature]</u> Date <u>6/28/18</u> Time <u>1530</u>			Received by _____ Date _____ Time _____			Relinquished by _____ Date _____ Time _____			Received by _____ Date _____ Time _____			9																																																																																																																																																																																																																																																																																																																																																																																														
8 Data Package Options (please circle if required) Type I - Full Type VI (Raw Data)			Relinquished by Commercial Carrier: UPS _____ FedEx <input checked="" type="checkbox"/> Other _____			Received by <u>[Signature]</u> Date <u>6/29/18</u> Time <u>1040</u>			Temperature Upon Receipt <u>0.0-2.4</u> °C			Custody Seals Intact? <u>Yes</u> No																																																																																																																																																																																																																																																																																																																																																																																																	

# Chevron Northwest Region Analysis Request/Chain of Custody



**Lancaster Laboratories**

Acct. # 11964

Group # 1961029

For Lancaster Laboratories use only

Sample # 9684389-413

Instructions on reverse side correspond with circled numbers.

1 Client Information			4 Matrix			5 Analyses Requested										6 Remarks														
Facility # <b>Edmonds Terminal</b>		WBS <b>NWENVPM600143080Z</b>	Sediment <input type="checkbox"/> Potable <input type="checkbox"/> Water <input type="checkbox"/> Oil <input type="checkbox"/>	Ground <input checked="" type="checkbox"/> NPDES <input type="checkbox"/> Air <input type="checkbox"/>	Surface <input type="checkbox"/>	Total Number of Containers BTEX-MTBE <input type="checkbox"/> 8260 <input checked="" type="checkbox"/> 8260 full scan <input type="checkbox"/>	Oxygenates NWTPH GX <input type="checkbox"/>	Silica Gel Cleanup <input checked="" type="checkbox"/>	Lead <input type="checkbox"/>	Diss. <input type="checkbox"/>	Method <input type="checkbox"/>	WAVPH <input type="checkbox"/>	WAEPH <input type="checkbox"/>	CRMS by USEPA 8270 SIM Sulfate, Nitrate USEPA 300.0 Dissolved Methane USEPA BSK175 Dissolved manganese USEPA 200.8	SCR #: _____															
Site Address <b>11720 UNOCO Rd, Edmonds, WA</b>		Chevron PM <b>Kim Jolitz</b>													Lead Consultant <b>Arcadis</b>	Consultant/Office <b>1100 Olive Way, Suite 800, Seattle WA 98101</b>	Consultant Project Mgr. <b>Scott Zorn</b>	Consultant Phone #												
Sampler <b>Eric Krueger, Jason Little, Patrick Collins, Alex Pink</b>																														
2 Sample Identification		3 Collected													Grab	Composite														
		Date													Time															
MW-515		6/28/18	1025																											
MW-516			1120																											
MW-517			1235																											
MW-518			1250																											
MW-520			1130																											
MW-521			1230																											
MW-522			1400																											
DUP-2																														
DUP-3																														
DUP-4																														
Trip Blank																														
7 Turnaround Time Requested (TAT) (please circle)			Relinquished by 			Date <b>6/28/18</b>		Time <b>1530</b>		Received by			Date		Time															
<input checked="" type="radio"/> Standard 5 day <input type="radio"/> 72 hour 48 hour 24 hour																														
8 Data Package Options (please circle if required)			Relinquished by Commerical Carrier:			Date		Time		Received by			Date		Time															
<input checked="" type="radio"/> Type I - Full <input type="radio"/> Type VI (Raw Data)			UPS _____ FedEx <input checked="" type="checkbox"/> Other _____										<b>6/29/18</b>		<b>1040</b>															
			Temperature Upon Receipt			<b>0.2-2.4 °C</b>		Custody Seals Intact?			<b>Yes</b>		<b>No</b>																	



Client: CHevron c/o Arcadis

**Delivery and Receipt Information**

Delivery Method: Fed Ex                      Arrival Timestamp: 06/29/2018 10:40  
 Number of Packages: 6                              Number of Projects: 1

**Arrival Condition Summary**

Shipping Container Sealed:	Yes	Sample IDs on COC match Containers:	Yes
Custody Seal Present:	Yes	Sample Date/Times match COC:	Yes
Custody Seal Intact:	Yes	VOA Vial Headspace $\geq$ 6mm:	Yes
Samples Chilled:	Yes	VOA IDs ( $\geq$ 6mm):	See Below
Paperwork Enclosed:	Yes	Total Trip Blank Qty:	6
Samples Intact:	Yes	Trip Blank Type:	HCI
Missing Samples:	No	Air Quality Samples Present:	No
Extra Samples:	No		
Discrepancy in Container Qty on COC:	Yes		

VOA Vial IDs (Headspace  $\geq$  6mm): 1 Tripblank

Unpacked by Nicole Reiff (25684) at 15:36 on 06/29/2018

**Samples Chilled Details**

Thermometer Types:      DT = Digital (Temp. Bottle)      IR = Infrared (Surface Temp)      All Temperatures in °C.

Cooler #	Thermometer ID	Corrected Temp	Therm. Type	Ice Type	Ice Present?	Ice Container	Elevated Temp?
1	DT146	0.6	DT	Wet	Y	Bagged	N
2	DT146	2.2	DT	Wet	Y	Bagged	N
3	DT146	0.2	DT	Wet	Y	Bagged	N
4	DT146	2.5	DT	Wet	Y	Bagged	N
5	DT146	1.5	DT	Wet	Y	Bagged	N
6	DT146	2.4	DT	Wet	Y	Bagged	N

**Container Quantity Discrepancy Details**

Sample ID on COC	Container Qty. Received	Container Qty. on COC	Comments
MW-13R	12	11	
MW-509	12	11	

# Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

<b>BMQL</b>	Below Minimum Quantitation Level	<b>mL</b>	milliliter(s)
<b>C</b>	degrees Celsius	<b>MPN</b>	Most Probable Number
<b>cfu</b>	colony forming units	<b>N.D.</b>	non-detect
<b>CP Units</b>	cobalt-chloroplatinate units	<b>ng</b>	nanogram(s)
<b>F</b>	degrees Fahrenheit	<b>NTU</b>	nephelometric turbidity units
<b>g</b>	gram(s)	<b>pg/L</b>	picogram/liter
<b>IU</b>	International Units	<b>RL</b>	Reporting Limit
<b>kg</b>	kilogram(s)	<b>TNTC</b>	Too Numerous To Count
<b>L</b>	liter(s)	<b>µg</b>	microgram(s)
<b>lb.</b>	pound(s)	<b>µL</b>	microliter(s)
<b>m3</b>	cubic meter(s)	<b>umhos/cm</b>	micromhos/cm
<b>meq</b>	milliequivalents	<b>MCL</b>	Maximum Contamination Limit
<b>mg</b>	milligram(s)		
<b>&lt;</b>	less than		
<b>&gt;</b>	greater than		
<b>ppm</b>	parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.		
<b>ppb</b>	parts per billion		
<b>Dry weight basis</b>	Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.		

**Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.**

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

This report shall not be reproduced except in full, without the written approval of the laboratory.

Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as "analyze immediately" are not performed within 15 minutes.

**WARRANTY AND LIMITS OF LIABILITY** - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. THE FOREGOING EXPRESS WARRANTY IS EXCLUSIVE AND IS GIVEN IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. WE DISCLAIM ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING A WARRANTY OF FITNESS FOR PARTICULAR PURPOSE AND WARRANTY OF MERCHANTABILITY. IN NO EVENT SHALL EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL, LLC BE LIABLE FOR INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR LOSS OF PROFIT OR GOODWILL REGARDLESS OF (A) THE NEGLIGENCE (EITHER SOLE OR CONCURRENT) OF EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL AND (B) WHETHER EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL HAS BEEN INFORMED OF THE POSSIBILITY OF SUCH DAMAGES. We accept no legal responsibility for the purposes for which the client uses the test results. No purchase order or other order for work shall be accepted by Eurofins Lancaster Laboratories Environmental which includes any conditions that vary from the Standard Terms and Conditions, and Eurofins Lancaster Laboratories Environmental hereby objects to any conflicting terms contained in any acceptance or order submitted by client.

# Data Qualifiers

Qualifier	Definition
C	Result confirmed by reanalysis
D1	Indicates for dual column analyses that the result is reported from column 1
D2	Indicates for dual column analyses that the result is reported from column 2
E	Concentration exceeds the calibration range
K1	Initial Calibration Blank is above the QC limit and the sample result is ND
K2	Continuing Calibration Blank is above the QC limit and the sample result is ND
K3	Initial Calibration Verification is above the QC limit and the sample result is ND
K4	Continuing Calibration Verification is above the QC limit and the sample result is ND
J (or G, I, X)	Estimated value $\geq$ the Method Detection Limit (MDL or DL) and $<$ the Limit of Quantitation (LOQ or RL)
P	Concentration difference between the primary and confirmation column $>40\%$ . The lower result is reported.
U	Analyte was not detected at the value indicated
V	Concentration difference between the primary and confirmation column $>100\%$ . The reporting limit is raised due to this disparity and evident interference.
W	The dissolved oxygen uptake for the unseeded blank is greater than 0.20 mg/L.
Z	Laboratory Defined - see analysis report

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods. Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.



## ANALYSIS REPORT

Prepared by:

Eurofins Lancaster Laboratories Environmental  
2425 New Holland Pike  
Lancaster, PA 17601

Prepared for:

Chevron Environmental Mgmt Co  
BR1 X5139C  
6101 Bollinger Canyon Road  
San Ramon CA 94583

Report Date: July 25, 2018 09:34

### Project: Edmonds Terminal

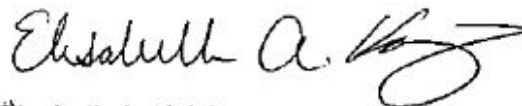
Account #: 11964  
Group Number: 1961256  
PO Number: 0015268291  
Release Number: JOLITZ  
State of Sample Origin: WA

To view our laboratory's current scopes of accreditation please go to <http://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster-laboratories-environmental/resources/certifications/>. Historical copies may be requested through your project manager.

Electronic Copy To Arcadis  
Electronic Copy To Arcadis  
Electronic Copy To Arcadis  
Electronic Copy To Arcadis  
Electronic Copy To ARCADIS U.S., Inc.  
Electronic Copy To Arcadis

Attn: Eric Krueger  
Attn: Ophelie Encelle  
Attn: Ryan Brauchla  
Attn: Jason Little  
Attn: Sam Miles  
Attn: Scott Zorn

Respectfully Submitted,



Elisabeth A. Knisley  
Project Manager

(717) 556-7262



### SAMPLE INFORMATION

<u>Client Sample Description</u>	<u>Sample Collection Date/Time</u>	<u>ELLE#</u>
MW-8R-W-180629 Grab Groundwater	06/29/2018 09:45	9685396
MW-20R-W-180629 Grab Groundwater	06/29/2018 09:20	9685397
MW-126-W-180629 Grab Groundwater	06/29/2018 08:30	9685398
MW-143-W-180629 Grab Groundwater	06/29/2018 08:00	9685399
MW-143-W-180629 MS Grab Groundwater	06/29/2018 08:00	9685400
MW-143-W-180629 MSD Grab Groundwater	06/29/2018 08:00	9685401
MW-143-W-180629 DUP Grab Groundwater	06/29/2018 08:00	9685402
Trip Blank-T-180629 NA Water	06/29/2018	9685403

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

**Sample Description:** MW-8R-W-180629 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9685396  
**ELLE Group #:** 1961256  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 06/30/2018 10:10

**Collection Date/Time:** 06/29/2018 09:45

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>					
<b>SW-846 8270C SIM</b>			<b>ug/l</b>	<b>ug/l</b>	
14243	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14243	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14243	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14243	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14243	Chrysene	218-01-9	N.D.	0.01	1
14243	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14243	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>					
<b>ECY 97-602 NWTPH-Gx</b>			<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	50	1
<b>GC Volatiles</b>					
<b>SW-846 8021B</b>			<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1
<b>GC Miscellaneous</b>					
<b>RSKSOP-175 modified</b>			<b>ug/l</b>	<b>ug/l</b>	
07105	Methane	74-82-8	4.4	3.0	1
<b>GC Petroleum Hydrocarbons w/Si</b>					
<b>ECY 97-602 NWTPH-Dx modified</b>			<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	51	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	110	1
<b>Trial ID: RE</b>					
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	47	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1
<p>The recovery for a target analyte(s) in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary. The following action was taken:</p> <p>The sample was re-extracted within the method required holding time and the LCS is compliant.</p> <p>The recovery for the method blank surrogate(s) is outside the QC acceptance limits as noted on the QC Summary in the second trial. Both trials are reported.</p>					
<b>Metals Dissolved</b>					
<b>EPA 200.8 rev 5.4</b>			<b>ug/l</b>	<b>ug/l</b>	
06037	Manganese	7439-96-5	19.8	4.9	1
<b>Wet Chemistry</b>					
<b>EPA 300.0</b>			<b>ug/l</b>	<b>ug/l</b>	
00368	Nitrate Nitrogen	14797-55-8	N.D.	250	5
<p>The holding time was not met. The client was notified and the data reported.</p>					
00228	Sulfate	14808-79-8	28,500	1,500	5

### Sample Comments

State of Washington Lab Certification No. C457  
This sample was field filtered for dissolved metals.



**Sample Description:** MW-8R-W-180629 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9685396  
**ELLE Group #:** 1961256  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 06/30/2018 10:10

**Collection Date/Time:** 06/29/2018 09:45

## Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14243	SIM SVOAs 8270C MINI	SW-846 8270C SIM	1	18184WAL026	07/06/2018 03:14	Catherine E Bachman	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18184WAL026	07/05/2018 08:00	Logan M Brosemer	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18186A94A	07/07/2018 00:34	Marie D Beamenderfer	1
02102	Method 8021 Water Master	SW-846 8021B	1	18186A94A	07/07/2018 00:34	Marie D Beamenderfer	1
01146	GC VOA Water Prep	SW-846 5030B	1	18186A94A	07/07/2018 00:34	Marie D Beamenderfer	1
07105	Volatile Headspace Hydrocarbon	RSKSOP-175 modified	1	181830003A	07/02/2018 23:44	Johanna C Kennedy	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	181860007A	07/11/2018 12:17	Thomas C Wildermuth	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	2-RE	181930030A	07/19/2018 01:19	Thomas C Wildermuth	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	181860007A	07/05/2018 21:29	Kate E Lutte	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	2	181930030A	07/13/2018 16:00	Oswaldo R Sanchez	1
06037	Manganese	EPA 200.8 rev 5.4	1	181870705002A	07/11/2018 13:38	Bradley M Berlot	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	181870705002	07/09/2018 04:56	James L Mertz	1
00368	Nitrate Nitrogen	EPA 300.0	1	18181265109A	07/01/2018 17:24	Kianat Zamir	5
00228	Sulfate	EPA 300.0	1	18181265109A	07/01/2018 17:24	Kianat Zamir	5

**Sample Description:** MW-20R-W-180629 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9685397  
**ELLE Group #:** 1961256  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 06/30/2018 10:10  
**Collection Date/Time:** 06/29/2018 09:20

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270C SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14243	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14243	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14243	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14243	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14243	Chrysene	218-01-9	N.D.	0.01	1
14243	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14243	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	50	1
<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1
<b>GC Miscellaneous</b>		<b>RSKSOP-175 modified</b>	<b>ug/l</b>	<b>ug/l</b>	
07105	Methane	74-82-8	160	3.0	1
<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	46	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1
<b>Trial ID: RE</b>					
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	45	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1
<p>The recovery for a target analyte(s) in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary. The following action was taken: The sample was re-extracted within the method required holding time and the LCS is compliant. The recovery for the method blank surrogate(s) is outside the QC acceptance limits as noted on the QC Summary in the second trial. Both trials are reported.</p>					
<b>Metals Dissolved</b>		<b>EPA 200.8 rev 5.4</b>	<b>ug/l</b>	<b>ug/l</b>	
06037	Manganese	7439-96-5	526	4.9	1
<b>Wet Chemistry</b>		<b>EPA 300.0</b>	<b>ug/l</b>	<b>ug/l</b>	
00368	Nitrate Nitrogen	14797-55-8	N.D.	250	5
The holding time was not met. The client was notified and the data reported.					
00228	Sulfate	14808-79-8	344,000	15,000	50

### Sample Comments

State of Washington Lab Certification No. C457  
This sample was field filtered for dissolved metals.

**Sample Description:** MW-20R-W-180629 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9685397  
**ELLE Group #:** 1961256  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 06/30/2018 10:10  
**Collection Date/Time:** 06/29/2018 09:20

## Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14243	SIM SVOAs 8270C MINI	SW-846 8270C SIM	1	18184WAL026	07/06/2018 12:24	Catherine E Bachman	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18184WAL026	07/05/2018 08:00	Logan M Brosemer	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18186A94A	07/07/2018 01:00	Marie D Beamenderfer	1
02102	Method 8021 Water Master	SW-846 8021B	1	18186A94A	07/07/2018 01:00	Marie D Beamenderfer	1
01146	GC VOA Water Prep	SW-846 5030B	1	18186A94A	07/07/2018 01:00	Marie D Beamenderfer	1
07105	Volatile Headspace Hydrocarbon	RSKSOP-175 modified	1	181830003A	07/03/2018 00:01	Johanna C Kennedy	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	181860007A	07/11/2018 12:40	Thomas C Wildermuth	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	2-RE	181930030A	07/19/2018 01:42	Thomas C Wildermuth	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	181860007A	07/05/2018 21:29	Kate E Lutte	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	2	181930030A	07/13/2018 16:00	Osvaldo R Sanchez	1
06037	Manganese	EPA 200.8 rev 5.4	1	181830705006A	07/12/2018 09:34	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	181830705006	07/03/2018 05:08	James L Mertz	1
00368	Nitrate Nitrogen	EPA 300.0	1	18181265109A	07/01/2018 18:17	Kianat Zamir	5
00228	Sulfate	EPA 300.0	1	18181265109A	07/01/2018 18:35	Kianat Zamir	50

**Sample Description:** MW-126-W-180629 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9685398  
**ELLE Group #:** 1961256  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 06/30/2018 10:10

**Collection Date/Time:** 06/29/2018 08:30

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>					
<b>SW-846 8270C SIM</b>			<b>ug/l</b>	<b>ug/l</b>	
14243	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14243	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14243	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14243	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14243	Chrysene	218-01-9	N.D.	0.01	1
14243	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14243	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>					
<b>ECY 97-602 NWTPH-Gx</b>			<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	50	1
<b>GC Volatiles</b>					
<b>SW-846 8021B</b>			<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1
<b>GC Miscellaneous</b>					
<b>RSKSOP-175 modified</b>			<b>ug/l</b>	<b>ug/l</b>	
07105	Methane	74-82-8	N.D.	3.0	1
<b>GC Petroleum Hydrocarbons w/Si</b>					
<b>ECY 97-602 NWTPH-Dx modified</b>			<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	46	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1
<b>Trial ID: RE</b>					
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	45	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1
<p>The recovery for a target analyte(s) in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary. The following action was taken:</p> <p>The sample was re-extracted within the method required holding time and the LCS is compliant.</p> <p>The recovery for the method blank surrogate(s) is outside the QC acceptance limits as noted on the QC Summary in the second trial. Both trials are reported.</p>					
<b>Metals Dissolved</b>					
<b>EPA 200.8 rev 5.4</b>			<b>ug/l</b>	<b>ug/l</b>	
06037	Manganese	7439-96-5	25.1	4.9	1
<b>Wet Chemistry</b>					
<b>EPA 300.0</b>			<b>ug/l</b>	<b>ug/l</b>	
00368	Nitrate Nitrogen	14797-55-8	N.D.	250	5
<p>The holding time was not met. The client was notified and the data reported.</p>					
00228	Sulfate	14808-79-8	26,800	1,500	5

### Sample Comments

State of Washington Lab Certification No. C457  
This sample was field filtered for dissolved metals.

**Sample Description:** MW-126-W-180629 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9685398  
**ELLE Group #:** 1961256  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 06/30/2018 10:10

**Collection Date/Time:** 06/29/2018 08:30

## Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14243	SIM SVOAs 8270C MINI	SW-846 8270C SIM	1	18184WAL026	07/06/2018 04:11	Catherine E Bachman	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18184WAL026	07/05/2018 08:00	Logan M Brosemer	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18186A94A	07/07/2018 01:26	Marie D Beamenderfer	1
02102	Method 8021 Water Master	SW-846 8021B	1	18186A94A	07/07/2018 01:26	Marie D Beamenderfer	1
01146	GC VOA Water Prep	SW-846 5030B	1	18186A94A	07/07/2018 01:26	Marie D Beamenderfer	1
07105	Volatile Headspace Hydrocarbon	RSKSOP-175 modified	1	181840006A	07/03/2018 13:10	Johanna C Kennedy	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	181860007A	07/11/2018 13:02	Thomas C Wildermuth	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	2-RE	181930030A	07/19/2018 02:05	Thomas C Wildermuth	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	181860007A	07/05/2018 21:29	Kate E Lutte	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	2	181930030A	07/13/2018 16:00	Osvaldo R Sanchez	1
06037	Manganese	EPA 200.8 rev 5.4	1	181830705006A	07/12/2018 09:36	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	181830705006	07/03/2018 05:08	James L Mertz	1
00368	Nitrate Nitrogen	EPA 300.0	1	18181265109A	07/01/2018 14:27	Kianat Zamir	5
00228	Sulfate	EPA 300.0	1	18181265109A	07/01/2018 14:27	Kianat Zamir	5

**Sample Description:** MW-143-W-180629 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9685399  
**ELLE Group #:** 1961256  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 06/30/2018 10:10

**Collection Date/Time:** 06/29/2018 08:00

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>					
<b>SW-846 8270C SIM</b>			<b>ug/l</b>	<b>ug/l</b>	
14243	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14243	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14243	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14243	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14243	Chrysene	218-01-9	N.D.	0.01	1
14243	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14243	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>					
<b>ECY 97-602 NWTPH-Gx</b>			<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	50	1
<b>GC Volatiles</b>					
<b>SW-846 8021B</b>			<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1
<b>GC Miscellaneous</b>					
<b>RSKSOP-175 modified</b>			<b>ug/l</b>	<b>ug/l</b>	
07105	Methane	74-82-8	1,000	30	10
<b>GC Petroleum Hydrocarbons w/Si</b>					
<b>ECY 97-602 NWTPH-Dx modified</b>			<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	47	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1
<b>Trial ID: RE</b>					
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	46	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1
<p>The recovery for a target analyte(s) in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary. The following action was taken:</p> <p>The sample was re-extracted within the method required holding time and the LCS is compliant.</p> <p>The recovery for the method blank surrogate(s) is outside the QC acceptance limits as noted on the QC Summary in the second trial. Both trials are reported.</p>					
<b>Metals Dissolved</b>					
<b>EPA 200.8 rev 5.4</b>			<b>ug/l</b>	<b>ug/l</b>	
06037	Manganese	7439-96-5	1,570	4.9	1
<b>Wet Chemistry</b>					
<b>EPA 300.0</b>			<b>ug/l</b>	<b>ug/l</b>	
00368	Nitrate Nitrogen	14797-55-8	N.D.	250	5
<p>The sample was originally analyzed within holding time for nitrate nitrogen; however the number of injections between bracketing continuing calibration checks and blanks exceeded the method's limit of 10 with 11 injections. The sample was reanalyzed outside of holding time on 07/01/2018 with a result of ND.</p>					
00228	Sulfate	14808-79-8	94,600	6,000	20

**Sample Description:** MW-143-W-180629 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9685399  
**ELLE Group #:** 1961256  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submittal Date/Time:** 06/30/2018 10:10  
**Collection Date/Time:** 06/29/2018 08:00

## Sample Comments

State of Washington Lab Certification No. C457  
This sample was field filtered for dissolved metals.

## Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14243	SIM SVOAs 8270C MINI	SW-846 8270C SIM	1	18184WAL026	07/06/2018 04:39	Catherine E Bachman	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18184WAL026	07/05/2018 08:00	Logan M Brosemer	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18186A94A	07/06/2018 20:18	Marie D Beamenderfer	1
02102	Method 8021 Water Master	SW-846 8021B	1	18186A94A	07/06/2018 20:18	Marie D Beamenderfer	1
01146	GC VOA Water Prep	SW-846 5030B	1	18186A94A	07/06/2018 20:18	Marie D Beamenderfer	1
07105	Volatile Headspace Hydrocarbon	RSKSOP-175 modified	1	181830003A	07/03/2018 18:26	Johanna C Kennedy	10
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	181860007A	07/11/2018 10:44	Thomas C Wildermuth	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	2-RE	181930030A	07/18/2018 23:45	Thomas C Wildermuth	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	181860007A	07/05/2018 21:29	Kate E Lutte	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	2	181930030A	07/13/2018 16:00	Oswaldo R Sanchez	1
06037	Manganese	EPA 200.8 rev 5.4	1	181830705006A	07/12/2018 09:11	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	181830705006	07/03/2018 05:08	James L Mertz	1
00368	Nitrate Nitrogen	EPA 300.0	1	18181265109A	06/30/2018 17:37	Kianat Zamir	5
00228	Sulfate	EPA 300.0	2	18181265109A	07/01/2018 12:40	Kianat Zamir	20

**Sample Description:** MW-143-W-180629 MS Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9685400  
**ELLE Group #:** 1961256  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 06/30/2018 10:10  
**Collection Date/Time:** 06/29/2018 08:00

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270C SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14243	Benzo(a)anthracene	56-55-3	1	0.01	1
14243	Benzo(a)pyrene	50-32-8	0.8	0.01	1
14243	Benzo(b)fluoranthene	205-99-2	0.9	0.01	1
14243	Benzo(k)fluoranthene	207-08-9	0.8	0.01	1
14243	Chrysene	218-01-9	0.8	0.01	1
14243	Dibenz(a,h)anthracene	53-70-3	0.7	0.02	1
14243	Indeno(1,2,3-cd)pyrene	193-39-5	0.8	0.01	1
<b>GC Volatiles</b>		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	1,500	50	1
<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	22	0.5	1
<b>GC Miscellaneous</b>		<b>RSKSOP-175 modified</b>	<b>ug/l</b>	<b>ug/l</b>	
07105	Methane	74-82-8	1,200 E	3.0	1
<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	150	47	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	110	1
<b>Trial ID: RE</b>					
12917	DX DRO C12-C24 w/ SiGel	n.a.	210	45	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1
The recovery for a target analyte(s) in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary. The following action was taken: The sample was re-extracted within the method required holding time and the LCS is compliant. The recovery for the method blank surrogate(s) is outside the QC acceptance limits as noted on the QC Summary in the second trial. Both trials are reported.					
<b>Metals Dissolved</b>		<b>EPA 200.8 rev 5.4</b>	<b>ug/l</b>	<b>ug/l</b>	
06037	Manganese	7439-96-5	1,690	4.9	1
<b>Wet Chemistry</b>		<b>EPA 300.0</b>	<b>ug/l</b>	<b>ug/l</b>	
00368	Nitrate Nitrogen	14797-55-8	2,500	250	5
The sample was originally analyzed within holding time for nitrate nitrogen; however the number of injections between bracketing continuing calibration checks and blanks exceeded the method's limit of 10 with 11 injections. The sample was reanalyzed outside of holding time on 07/01/2018 with a result of 2500 ug/l.					
00228	Sulfate	14808-79-8	202,000	6,000	20



**Sample Description:** MW-143-W-180629 MS Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9685400  
**ELLE Group #:** 1961256  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submittal Date/Time:** 06/30/2018 10:10

**Collection Date/Time:** 06/29/2018 08:00

## Sample Comments

State of Washington Lab Certification No. C457  
This sample was field filtered for dissolved metals.

## Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14243	SIM SVOAs 8270C MINI	SW-846 8270C SIM	1	18184WAL026	07/06/2018 05:07	Catherine E Bachman	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18184WAL026	07/05/2018 08:00	Logan M Brosemer	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18186A94A	07/06/2018 21:35	Marie D Beamenderfer	1
02102	Method 8021 Water Master	SW-846 8021B	1	18186A94A	07/06/2018 20:44	Marie D Beamenderfer	1
01146	GC VOA Water Prep	SW-846 5030B	1	18186A94A	07/06/2018 20:44	Marie D Beamenderfer	1
01146	GC VOA Water Prep	SW-846 5030B	2	18186A94A	07/06/2018 21:35	Marie D Beamenderfer	1
07105	Volatile Headspace Hydrocarbon	RSKSOP-175 modified	1	181830003A	07/02/2018 19:31	Johanna C Kennedy	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	181860007A	07/11/2018 11:07	Thomas C Wildermuth	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	2-RE	181930030A	07/19/2018 00:08	Thomas C Wildermuth	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	181860007A	07/05/2018 21:29	Kate E Lutte	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	2	181930030A	07/13/2018 16:00	Osvaldo R Sanchez	1
06037	Manganese	EPA 200.8 rev 5.4	1	181830705006A	07/12/2018 09:17	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	181830705006	07/03/2018 05:08	James L Mertz	1
00368	Nitrate Nitrogen	EPA 300.0	1	18181265109A	06/30/2018 18:48	Kianat Zamir	5
00228	Sulfate	EPA 300.0	2	18181265109A	07/01/2018 13:51	Kianat Zamir	20

**Sample Description:** MW-143-W-180629 MSD Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9685401  
**ELLE Group #:** 1961256  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 06/30/2018 10:10  
**Collection Date/Time:** 06/29/2018 08:00

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270C SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14243	Benzo(a)anthracene	56-55-3	0.9	0.01	1
14243	Benzo(a)pyrene	50-32-8	0.7	0.01	1
14243	Benzo(b)fluoranthene	205-99-2	0.8	0.01	1
14243	Benzo(k)fluoranthene	207-08-9	0.7	0.01	1
14243	Chrysene	218-01-9	0.7	0.01	1
14243	Dibenz(a,h)anthracene	53-70-3	0.6	0.02	1
14243	Indeno(1,2,3-cd)pyrene	193-39-5	0.7	0.01	1
<b>GC Volatiles</b>		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	1,500	50	1
<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	22	0.5	1
<b>GC Miscellaneous</b>		<b>RSKSOP-175 modified</b>	<b>ug/l</b>	<b>ug/l</b>	
07105	Methane	74-82-8	1,100 E	3.0	1
<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	140	47	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1
<b>Trial ID: RE</b>					
12917	DX DRO C12-C24 w/ SiGel	n.a.	200	45	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1

The recovery for a target analyte(s) in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary. The following action was taken:

The sample was re-extracted within the method required holding time and the LCS is compliant.

The recovery for the method blank surrogate(s) is outside the QC acceptance limits as noted on the QC Summary in the second trial. Both trials are reported.

## Sample Comments

State of Washington Lab Certification No. C457

## Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14243	SIM SVOAs 8270C MINI	SW-846 8270C SIM	1	18184WAL026	07/06/2018 05:36	Catherine E Bachman	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18184WAL026	07/05/2018 08:00	Logan M Brosemer	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18186A94A	07/06/2018 22:01	Marie D Beamenderfer	1

**Sample Description:** MW-143-W-180629 MSD Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9685401  
**ELLE Group #:** 1961256  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submittal Date/Time:** 06/30/2018 10:10  
**Collection Date/Time:** 06/29/2018 08:00

## Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
02102	Method 8021 Water Master	SW-846 8021B	1	18186A94A	07/06/2018 21:10	Marie D Beamenderfer	1
01146	GC VOA Water Prep	SW-846 5030B	1	18186A94A	07/06/2018 21:10	Marie D Beamenderfer	1
01146	GC VOA Water Prep	SW-846 5030B	2	18186A94A	07/06/2018 22:01	Marie D Beamenderfer	1
07105	Volatile Headspace Hydrocarbon	RSKSOP-175 modified	1	181830003A	07/02/2018 19:48	Johanna C Kennedy	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	181860007A	07/11/2018 11:30	Thomas C Wildermuth	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	2-RE	181930030A	07/19/2018 00:32	Thomas C Wildermuth	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	181860007A	07/05/2018 21:29	Kate E Lutte	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	2	181930030A	07/13/2018 16:00	Osvaldo R Sanchez	1

**Sample Description:** MW-143-W-180629 DUP Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9685402  
**ELLE Group #:** 1961256  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 06/30/2018 10:10  
**Collection Date/Time:** 06/29/2018 08:00

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>Metals Dissolved</b>		<b>EPA 200.8 rev 5.4</b>	<b>ug/l</b>	<b>ug/l</b>	
06037	Manganese	7439-96-5	1,630	4.9	1
<b>Wet Chemistry</b>		<b>EPA 300.0</b>	<b>ug/l</b>	<b>ug/l</b>	
00368	Nitrate Nitrogen	14797-55-8	N.D.	250	5
The sample was originally analyzed within holding time for nitrate nitrogen; however the number of injections between bracketing continuing calibration checks and blanks exceeded the method's limit of 10 with 11 injections. The sample was reanalyzed outside of holding time on 07/01/2018 with a result of ND.					
00228	Sulfate	14808-79-8	98,700	6,000	20

### Sample Comments

State of Washington Lab Certification No. C457  
This sample was field filtered for dissolved metals.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06037	Manganese	EPA 200.8 rev 5.4	1	181830705006A	07/12/2018 09:15	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	181830705006	07/03/2018 05:08	James L Mertz	1
00368	Nitrate Nitrogen	EPA 300.0	1	18181265109A	06/30/2018 18:12	Kianat Zamir	5
00228	Sulfate	EPA 300.0	2	18181265109A	07/01/2018 13:16	Kianat Zamir	20

**Sample Description:** Trip Blank-T-180629 NA Water  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9685403  
**ELLE Group #:** 1961256  
**Matrix:** Water

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 06/30/2018 10:10  
**Collection Date/Time:** 06/29/2018

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC Volatiles</b>					
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx n.a.	ug/l N.D.	ug/l 50	1
<b>GC Volatiles</b>					
02102	Benzene	SW-846 8021B 71-43-2	ug/l N.D.	ug/l 0.5	1

### Sample Comments

State of Washington Lab Certification No. C457

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18186A94A	07/06/2018 19:53	Marie D Beamenderfer	1
02102	Method 8021 Water Master	SW-846 8021B	1	18186A94A	07/06/2018 19:53	Marie D Beamenderfer	1
01146	GC VOA Water Prep	SW-846 5030B	1	18186A94A	07/06/2018 19:53	Marie D Beamenderfer	1

## Quality Control Summary

Client Name: Chevron Environmental Mgmt Co  
Reported: 07/25/2018 09:34

Group Number: 1961256

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

### Method Blank

Analysis Name	Result ug/l	MDL ug/l
Batch number: 18184WAL026	Sample number(s): 9685396-9685401	
Benzo(a)anthracene	N.D.	0.01
Benzo(a)pyrene	N.D.	0.01
Benzo(b)fluoranthene	N.D.	0.01
Benzo(k)fluoranthene	N.D.	0.01
Chrysene	N.D.	0.01
Dibenz(a,h)anthracene	N.D.	0.02
Indeno(1,2,3-cd)pyrene	N.D.	0.01
Batch number: 18186A94A	Sample number(s): 9685396-9685401,9685403	
Benzene	N.D.	0.2
NWTPH-Gx water C7-C12	N.D.	50
Batch number: 181830003A	Sample number(s): 9685396-9685397,9685399-9685401	
Methane	N.D.	3.0
Batch number: 181840006A	Sample number(s): 9685398	
Methane	N.D.	3.0
Batch number: 181860007A	Sample number(s): 9685396-9685401	
DX DRO C12-C24 w/ SiGel	N.D.	45
DX HRO C24-C40 w/ SiGel	N.D.	100
Batch number: 181930030A	Sample number(s): 9685396-9685401	
DX DRO C12-C24 w/ SiGel	N.D.	45
DX HRO C24-C40 w/ SiGel	N.D.	100
Batch number: 181830705006A	Sample number(s): 9685397-9685400,9685402	
Manganese	N.D.	4.9
Batch number: 181870705002A	Sample number(s): 9685396	
Manganese	N.D.	4.9
Batch number: 18181265109A	Sample number(s): 9685396-9685400,9685402	
Nitrate Nitrogen	N.D.	50
Sulfate	N.D.	300

### LCS/LCSD

Analysis Name	LCS Spike Added	LCS Conc	LCSD Spike Added	LCSD Conc	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
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\*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

## Quality Control Summary

Client Name: Chevron Environmental Mgmt Co  
Reported: 07/25/2018 09:34

Group Number: 1961256

### LCS/LCSD

Analysis Name	LCS Spike Added ug/l	LCS Conc ug/l	LCSD Spike Added ug/l	LCSD Conc ug/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: 18184WAL026	Sample number(s): 9685396-9685401								
Benzo(a)anthracene	1.00	0.857			86		65-129		
Benzo(a)pyrene	1.00	0.861			86		65-126		
Benzo(b)fluoranthene	1.00	0.944			94		65-136		
Benzo(k)fluoranthene	1.00	0.811			81		65-131		
Chrysene	1.00	0.772			77		62-129		
Dibenz(a,h)anthracene	1.00	0.795			79		50-139		
Indeno(1,2,3-cd)pyrene	1.00	0.778			78		52-133		
	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>					
Batch number: 18186A94A	Sample number(s): 9685396-9685401,9685403								
Benzene	20	20.53			103		80-120		
NWTPH-Gx water C7-C12	1100	1313.49			119		80-120		
	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>					
Batch number: 181830003A	Sample number(s): 9685396-9685397,9685399-9685401								
Methane	59.8	61.92			104		85-115		
Batch number: 181840006A	Sample number(s): 9685398								
Methane	59.8	62.87	59.8	61.62	105	103	85-115	2	20
	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>					
Batch number: 181860007A	Sample number(s): 9685396-9685401								
DX DRO C12-C24 w/ SiGel	600	167.53			28*		30-115		
Batch number: 181930030A	Sample number(s): 9685396-9685401								
DX DRO C12-C24 w/ SiGel	600	211.53			35		30-115		
	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>					
Batch number: 181830705006A	Sample number(s): 9685397-9685400,9685402								
Manganese	50	53.49			107		85-115		
Batch number: 181870705002A	Sample number(s): 9685396								
Manganese	50	51.84			104		85-115		
	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>					
Batch number: 18181265109A	Sample number(s): 9685396-9685400,9685402								
Nitrate Nitrogen	750	759.36			101		90-110		
Sulfate	7500	7785.63			104		90-110		

\*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

## Quality Control Summary

Client Name: Chevron Environmental Mgmt Co  
Reported: 07/25/2018 09:34

Group Number: 1961256

### MS/MSD

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc ug/l	MS Spike Added ug/l	MS Conc ug/l	MSD Spike Added ug/l	MSD Conc ug/l	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Batch number: 18184WAL026	Sample number(s): 9685396-9685401 UNSPK: 9685399									
Benzo(a)anthracene	N.D.	1.03	0.960	1.01	0.904	93	89	65-129	6	30
Benzo(a)pyrene	N.D.	1.03	0.797	1.01	0.748	77	74	65-126	6	30
Benzo(b)fluoranthene	N.D.	1.03	0.862	1.01	0.812	83	80	65-136	6	30
Benzo(k)fluoranthene	N.D.	1.03	0.751	1.01	0.711	73	70	65-131	5	30
Chrysene	N.D.	1.03	0.759	1.01	0.728	73	72	62-129	4	30
Dibenz(a,h)anthracene	N.D.	1.03	0.705	1.01	0.630	68	62	50-139	11	30
Indeno(1,2,3-cd)pyrene	N.D.	1.03	0.760	1.01	0.675	74	67	52-133	12	30
	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>					
Batch number: 18186A94A	Sample number(s): 9685396-9685401,9685403 UNSPK: 9685399									
Benzene	N.D.	20	21.81	20	21.65	109	108	80-120	1	30
NWTPH-Gx water C7-C12	N.D.	1100	1474.26	1100	1480.93	134*	135*	80-120	0	30
	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>					
Batch number: 181830003A	Sample number(s): 9685396-9685397,9685399-9685401 UNSPK: 9685399									
Methane	1008.98	59.8	1235.07	59.8	1129.56	378 (2)	202 (2)	73-125	9	30
	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>					
Batch number: 181860007A	Sample number(s): 9685396-9685401 UNSPK: 9685399									
DX DRO C12-C24 w/ SiGel	N.D.	630	145.73	625	142.62	23*	23*	30-115	2	20
	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>					
Batch number: 181930030A	Sample number(s): 9685396-9685401 UNSPK: 9685399									
DX DRO C12-C24 w/ SiGel	N.D.	603	213.51	603	195.19	35	32	30-115	9	20
	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>					
Batch number: 181830705006A	Sample number(s): 9685397-9685400,9685402 UNSPK: 9685399									
Manganese	1573	50	1685			224 (2)		70-130		
	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>					
Batch number: 181870705002A	Sample number(s): 9685396 UNSPK: 9685396									
Manganese	19.82	50	73.5			107		70-130		
	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>					
Batch number: 18181265109A	Sample number(s): 9685396-9685400,9685402 UNSPK: 9685399									
Nitrate Nitrogen	N.D.	2500	2499.5			100		90-110		
Sulfate	94578.74	100000	201733.5			107		90-110		
	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>					

\*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.



## Quality Control Summary

Client Name: Chevron Environmental Mgmt Co  
Reported: 07/25/2018 09:34

Group Number: 1961256

### Laboratory Duplicate

Background (BKG) = the sample used in conjunction with the duplicate

Analysis Name	BKG Conc ug/l	DUP Conc ug/l	DUP RPD	DUP RPD Max
Batch number: 181830705006A Manganese	Sample number(s): 9685397-9685400,9685402 BKG: 9685399			
	1573	1629	3	20
Batch number: 181870705002A Manganese	Sample number(s): 9685396 BKG: 9685396			
	19.82	19.34	2 (1)	20
	ug/l	ug/l		
Batch number: 18181265109A Nitrate Nitrogen	Sample number(s): 9685396-9685400,9685402 BKG: 9685399			
	N.D.	N.D.	0 (1)	15
Sulfate	94578.74	98683.57	4 (1)	15

### Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: SIM SVOAs 8270C MINI

Batch number: 18184WAL026

	Fluoranthene-d10	Benzo(a)pyrene-d12	1-Methylnaphthalene-d10
9685396	83	75	69
9685397	65	35	67
9685398	74	72	71
9685399	63	65	66
9685400	77	71	74
9685401	77	67	75
Blank	81	67	67
LCS	84	77	76
MS	77	71	74
MSD	77	67	75
Limits:	43-130	23-144	31-121

Analysis Name: Method 8021 Water Master

Batch number: 18186A94A

	Trifluorotoluene-P	Trifluorotoluene-F
9685396	84	79
9685397	85	81
9685398	84	78
9685399	84	79
9685400	82	97
9685401	82	99
9685403	84	90

\*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

## Quality Control Summary

Client Name: Chevron Environmental Mgmt Co  
Reported: 07/25/2018 09:34

Group Number: 1961256

### Surrogate Quality Control (continued)

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: Method 8021 Water Master  
Batch number: 18186A94A

	Trifluorotoluene-P	Trifluorotoluene-F
Blank	83	84
LCS	82	97
MS	82	97
MSD	82	99
Limits:	51-120	50-150

Analysis Name: Volatile Headspace Hydrocarbon  
Batch number: 181830003A

	Propene
9685396	92
9685397	92
9685399	86
9685400	92
9685401	91
Blank	100
LCS	96
MS	92
MSD	91
Limits:	57-128

Analysis Name: Volatile Headspace Hydrocarbon  
Batch number: 181840006A

	Propene
9685398	90
Blank	104
LCS	103
LCSD	104
Limits:	57-128

Analysis Name: NWTPH-Dx water w/Si Gel  
Batch number: 181860007A

	Orthoterphenyl	Capric Acid
9685396	68	0
9685397	60	0
9685398	53	0
9685399	49*	0
9685400	45*	0
9685401	46*	0
Blank	65	0

\*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

## Quality Control Summary

Client Name: Chevron Environmental Mgmt Co  
Reported: 07/25/2018 09:34

Group Number: 1961256

### Surrogate Quality Control (continued)

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: NWTPH-Dx water w/Si Gel  
Batch number: 181860007A

	Orthoterphenyl	Capric Acid
LCS	53	0
MS	45*	0
MSD	46*	0
Limits:	50-150	0-1

Analysis Name: NWTPH-Dx water w/Si Gel  
Batch number: 181930030A

	Orthoterphenyl	Capric Acid
9685396RE	67	0
9685397RE	70	0
9685398RE	60	0
9685399RE	63	0
9685400RE	63	0
9685401RE	56	0
Blank	49*	0
LCS	55	0
MS	63	0
MSD	56	0
Limits:	50-150	0-1

\*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

# Chevron Northwest Region Analysis Request/Chain of Custody



Lancaster Laboratories

Acct. # 11964

For Lancaster Laboratories use only  
Group # 1961256 Sample # 9685396  
Instructions on reverse side correspond with circled numbers.

1 Client Information				4 Matrix				5 Analyses Requested								6 Remarks								
Facility # Edmonds Terminal		WBS NWENVPK100430302		Soil <input type="checkbox"/>	Water <input checked="" type="checkbox"/>	Oil <input type="checkbox"/>	Total Number of Containers	BTEX-MTBE <input type="checkbox"/>	8260 <input checked="" type="checkbox"/>	8260 Naphth <input type="checkbox"/>	Oxygenates	NWTPH GX	NWTPH DX <input type="checkbox"/>	Silica Gel Cleanup <input checked="" type="checkbox"/>	Lead <input type="checkbox"/>	Total <input type="checkbox"/>	Diss. <input type="checkbox"/>	Method <input type="checkbox"/>	WAVPH <input type="checkbox"/>	WAEPH <input type="checkbox"/>	SCR #: _____  <input type="checkbox"/> Results in Dry Weight <input type="checkbox"/> J value reporting needed <input type="checkbox"/> Must meet lowest detection limits possible for 8260 compounds <input type="checkbox"/> 8021 MTBE Confirmation <input type="checkbox"/> Confirm MTBE + Naphthalene <input type="checkbox"/> Confirm highest hit by 8260 <input type="checkbox"/> Confirm all hits by 8260 <input type="checkbox"/> Run ___ oxy's on highest hit <input type="checkbox"/> Run ___ oxy's on all hits			
Site Address 11720 UNOCO Rd, Edmonds, WA		Chevron PM Kim Solitz		Potable <input type="checkbox"/>	Ground <input checked="" type="checkbox"/>	Surface <input type="checkbox"/>		8260 full scan																
Lead Consultant Arcadis		Consultant/Office 1100 Olive Way, Suite 800, Seattle WA 98101		NPDES <input type="checkbox"/>	Air <input type="checkbox"/>																			
Consultant Project Mgr. Scott Zorn		Consultant Phone #		Grab <input type="checkbox"/>	Composite <input type="checkbox"/>																			
Sampler Eric Krueger, Jason Little		Sample Identification																						
		Collected																						
		Date	Time																					
		MW-8R	6/29/18 0945																					
		MW-20R	0920																					
		MW-126	0830																					
		MW-143	0800																					
		MW-143 MS	0800																					
		MW-143 MSD	0800																					
		Trip Blank																						
7 Turnaround Time Requested (TAT) (please circle)				Relinquished by <i>[Signature]</i>				Date 6/29/18		Time 1200		Received by		Date		Time		9						
Standard 5 day 4 day				Relinquished by				Date		Time		Received by		Date		Time								
72 hour 48 hour 24 hour																								
8 Data Package Options (please circle if required)				Relinquished by Commerical Carrier:				UPS _____		FedEx <input checked="" type="checkbox"/>		Other _____		Received by <i>[Signature]</i>		Date 6/30/18		Time 1010						
Type I - Full Type VI (Raw Data)				Temperature Upon Receipt 15.24 °C				Custody Seals Intact? (Yes) No																



Client: Arcadis

**Delivery and Receipt Information**

Delivery Method:	<u>Fed Ex</u>	Arrival Timestamp:	<u>06/30/2018 10:10</u>
Number of Packages:	<u>2</u>	Number of Projects:	<u>1</u>
State/Province of Origin:	<u>WA</u>		

**Arrival Condition Summary**

Shipping Container Sealed:	Yes	Sample IDs on COC match Containers:	Yes
Custody Seal Present:	Yes	Sample Date/Times match COC:	Yes
Custody Seal Intact:	Yes	VOA Vial Headspace $\geq$ 6mm:	No
Samples Chilled:	Yes	Total Trip Blank Qty:	2
Paperwork Enclosed:	Yes	Trip Blank Type:	HCl
Samples Intact:	Yes	Air Quality Samples Present:	No
Missing Samples:	No		
Extra Samples:	No		
Discrepancy in Container Qty on COC:	No		

*Unpacked by Simon Nies (25112) at 10:53 on 06/30/2018*

**Samples Chilled Details**

Thermometer Types: DT = Digital (Temp. Bottle) IR = Infrared (Surface Temp) All Temperatures in °C.

Cooler #	Thermometer ID	Corrected Temp	Therm. Type	Ice Type	Ice Present?	Ice Container	Elevated Temp?
1	DT42-02	1.5	DT	Wet	Y	Bagged	N
2	DT42-02	2.4	DT	Wet	Y	Bagged	N

# Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

<b>BMQL</b>	Below Minimum Quantitation Level	<b>mL</b>	milliliter(s)
<b>C</b>	degrees Celsius	<b>MPN</b>	Most Probable Number
<b>cfu</b>	colony forming units	<b>N.D.</b>	non-detect
<b>CP Units</b>	cobalt-chloroplatinate units	<b>ng</b>	nanogram(s)
<b>F</b>	degrees Fahrenheit	<b>NTU</b>	nephelometric turbidity units
<b>g</b>	gram(s)	<b>pg/L</b>	picogram/liter
<b>IU</b>	International Units	<b>RL</b>	Reporting Limit
<b>kg</b>	kilogram(s)	<b>TNTC</b>	Too Numerous To Count
<b>L</b>	liter(s)	<b>µg</b>	microgram(s)
<b>lb.</b>	pound(s)	<b>µL</b>	microliter(s)
<b>m3</b>	cubic meter(s)	<b>umhos/cm</b>	micromhos/cm
<b>meq</b>	milliequivalents	<b>MCL</b>	Maximum Contamination Limit
<b>mg</b>	milligram(s)		
<b>&lt;</b>	less than		
<b>&gt;</b>	greater than		
<b>ppm</b>	parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.		
<b>ppb</b>	parts per billion		
<b>Dry weight basis</b>	Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.		

**Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.**

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

This report shall not be reproduced except in full, without the written approval of the laboratory.

Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as "analyze immediately" are not performed within 15 minutes.

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# Data Qualifiers

Qualifier	Definition
C	Result confirmed by reanalysis
D1	Indicates for dual column analyses that the result is reported from column 1
D2	Indicates for dual column analyses that the result is reported from column 2
E	Concentration exceeds the calibration range
K1	Initial Calibration Blank is above the QC limit and the sample result is ND
K2	Continuing Calibration Blank is above the QC limit and the sample result is ND
K3	Initial Calibration Verification is above the QC limit and the sample result is ND
K4	Continuing Calibration Verification is above the QC limit and the sample result is ND
J (or G, I, X)	Estimated value $\geq$ the Method Detection Limit (MDL or DL) and $<$ the Limit of Quantitation (LOQ or RL)
P	Concentration difference between the primary and confirmation column $>40\%$ . The lower result is reported.
U	Analyte was not detected at the value indicated
V	Concentration difference between the primary and confirmation column $>100\%$ . The reporting limit is raised due to this disparity and evident interference.
W	The dissolved oxygen uptake for the unseeded blank is greater than 0.20 mg/L.
Z	Laboratory Defined - see analysis report

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods. Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.



## ANALYSIS REPORT

Prepared by:

Eurofins Lancaster Laboratories Environmental  
2425 New Holland Pike  
Lancaster, PA 17601

Prepared for:

Chevron Environmental Mgmt Co  
BR1 X5139C  
6101 Bollinger Canyon Road  
San Ramon CA 94583

Report Date: September 30, 2018 20:15

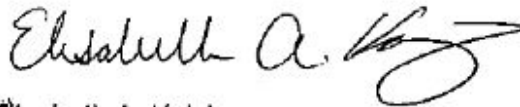
### Project: Edmonds Terminal

Account #: 11964  
Group Number: 1988392  
PO Number: 0015268291  
Release Number: JOLITZ  
State of Sample Origin: WA

Electronic Copy To Arcadis  
Electronic Copy To ARCADIS U.S., Inc.  
Electronic Copy To Arcadis  
Electronic Copy To Arcadis  
Electronic Copy To Arcadis  
Electronic Copy To Arcadis

Attn: Scott Zorn  
Attn: Sam Miles  
Attn: Jason Little  
Attn: Ryan Brauchla  
Attn: Ophelie Encelle  
Attn: Eric Krueger

Respectfully Submitted,



Elisabeth A. Knisley  
Project Manager

(717) 556-7262

To view our laboratory's current scopes of accreditation please go to <http://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster-laboratories-environmental/resources/certifications/>. Historical copies may be requested through your project manager.





## SAMPLE INFORMATION

<u>Client Sample Description</u>	<u>Sample Collection Date/Time</u>	<u>ELLE#</u>
MW-E-R-W-180917 Grab Groundwater	09/17/2018 12:35	9807865
MW-104-W-180917 Grab Groundwater	09/17/2018 09:45	9807866
MW-129R-W-180917 Grab Groundwater	09/17/2018 13:10	9807867
MW-525-W-180917 Grab Groundwater	09/17/2018 09:00	9807868
MW-526-W-180917 Grab Groundwater	09/17/2018 10:50	9807869
MW-531-W-180917 Grab Groundwater	09/17/2018 08:55	9807870
MW-532-W-180917 Grab Groundwater	09/17/2018 10:15	9807871
MW-533-W-180917 Grab Groundwater	09/17/2018 11:40	9807872
MW-534-W-180917 Grab Groundwater	09/17/2018 11:50	9807873
MW-535-W-180917 Grab Groundwater	09/17/2018 10:55	9807874
DUP-1-WD-180917 Grab Groundwater	09/17/2018	9807875
QA-T-180917 NA Water	09/17/2018	9807876

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

**Sample Description:** MW-E-R-W-180917 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9807865  
**ELLE Group #:** 1988392  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 09/18/2018 10:00  
**Collection Date/Time:** 09/17/2018 12:35

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270D SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14244	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14244	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14244	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14244	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14244	Chrysene	218-01-9	N.D.	0.01	1
14244	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1

The recovery for a target analyte(s) in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary. Since the recovery is high and the target analyte(s) was not detected in the sample, the data is reported.

<b>GC Volatiles</b>		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	590	19	1

<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1

<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	280	47	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1

The reverse surrogate, capric acid, is present at <1%.

### Sample Comments

State of Washington Lab Certification No. C457  
Carcinogenic PAHs have been reported for this sample

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	18262WAC026	09/20/2018 20:11	Brandon K Cordova	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18262WAC026	09/20/2018 08:00	Logan M Brosemer	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18262B94A	09/22/2018 01:43	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18262B94A	09/22/2018 01:43	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18262B94A	09/22/2018 01:43	Jeremy C Giffin	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	182640023A	09/25/2018 22:27	Marisa Englebright	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	182640023A	09/21/2018 20:00	Mathias Okpo	1

**Sample Description:** MW-104-W-180917 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9807866  
**ELLE Group #:** 1988392  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 09/18/2018 10:00  
**Collection Date/Time:** 09/17/2018 09:45

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270D SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14244	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14244	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14244	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14244	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14244	Chrysene	218-01-9	N.D.	0.01	1
14244	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	19	1
<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1
<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	46	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1
The reverse surrogate, capric acid, is present at <1%.					

### Sample Comments

State of Washington Lab Certification No. C457  
Carcinogenic PAHs have been reported for this sample

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	18264WAM026	09/25/2018 08:43	Catherine E Bachman	1
10466	BNA Water Extraction SIM	SW-846 3510C	2	18264WAM026	09/24/2018 21:45	Mathias Okpo	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18262B94A	09/22/2018 02:09	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18262B94A	09/22/2018 02:09	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18262B94A	09/22/2018 02:09	Jeremy C Giffin	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	182640023A	09/25/2018 22:50	Marisa Englebright	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	182640023A	09/21/2018 20:00	Mathias Okpo	1

**Sample Description:** MW-129R-W-180917 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9807867  
**ELLE Group #:** 1988392  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 09/18/2018 10:00  
**Collection Date/Time:** 09/17/2018 13:10

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270D SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14244	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14244	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14244	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14244	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14244	Chrysene	218-01-9	N.D.	0.01	1
14244	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1

The recovery for a target analyte(s) in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary. Since the recovery is high and the target analyte(s) was not detected in the sample, the data is reported.

<b>GC Volatiles</b>		<b>ECY 97-602 NWTTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTTPH-Gx water C7-C12	n.a.	38	19	1

<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1

<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWTTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	81	51	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	110	1

The reverse surrogate, capric acid, is present at <1%.

### Sample Comments

State of Washington Lab Certification No. C457  
Carcinogenic PAHs have been reported for this sample

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	18262WAC026	09/20/2018 21:07	Brandon K Cordova	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18262WAC026	09/20/2018 08:00	Logan M Brosemer	1
08274	NWTTPH-Gx water C7-C12	ECY 97-602 NWTTPH-Gx	1	18262B94A	09/22/2018 03:25	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18262B94A	09/22/2018 03:25	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18262B94A	09/22/2018 03:25	Jeremy C Giffin	1
12917	NWTTPH-Dx water w/Si Gel	ECY 97-602 NWTTPH-Dx modified	1	182640023A	09/25/2018 23:13	Marisa Englebright	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTTPH-Dx 06/97	1	182640023A	09/21/2018 20:00	Mathias Okpo	1

**Sample Description:** MW-525-W-180917 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9807868  
**ELLE Group #:** 1988392  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 09/18/2018 10:00  
**Collection Date/Time:** 09/17/2018 09:00

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270D SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14244	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14244	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14244	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14244	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14244	Chrysene	218-01-9	N.D.	0.01	1
14244	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	570	19	1
<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	6.6	0.5	1
<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	47	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1
The reverse surrogate, capric acid, is present at <1%.					

### Sample Comments

State of Washington Lab Certification No. C457  
Carcinogenic PAHs have been reported for this sample

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	18264WAM026	09/25/2018 09:12	Catherine E Bachman	1
10466	BNA Water Extraction SIM	SW-846 3510C	2	18264WAM026	09/24/2018 21:45	Mathias Okpo	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18262B94A	09/22/2018 03:51	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18262B94A	09/22/2018 03:51	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18262B94A	09/22/2018 03:51	Jeremy C Giffin	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	182640023A	09/25/2018 23:36	Marisa Englebright	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	182640023A	09/21/2018 20:00	Mathias Okpo	1

**Sample Description:** MW-526-W-180917 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9807869  
**ELLE Group #:** 1988392  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 09/18/2018 10:00  
**Collection Date/Time:** 09/17/2018 10:50

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270D SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14244	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14244	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14244	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14244	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14244	Chrysene	218-01-9	N.D.	0.01	1
14244	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1

The recovery for a target analyte(s) in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary. Since the recovery is high and the target analyte(s) was not detected in the sample, the data is reported.

<b>GC Volatiles</b>		<b>ECY 97-602 NWT PH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWT PH-Gx water C7-C12	n.a.	710	19	1

<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1

<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWT PH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	48	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	110	1

The reverse surrogate, capric acid, is present at <1%.

### Sample Comments

State of Washington Lab Certification No. C457  
Carcinogenic PAHs have been reported for this sample

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	18262WAC026	09/20/2018 22:03	Brandon K Cordova	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18262WAC026	09/20/2018 08:00	Logan M Brosemer	1
08274	NWT PH-Gx water C7-C12	ECY 97-602 NWT PH-Gx	1	18262B94A	09/22/2018 04:17	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18262B94A	09/22/2018 04:17	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18262B94A	09/22/2018 04:17	Jeremy C Giffin	1
12917	NWT PH-Dx water w/Si Gel	ECY 97-602 NWT PH-Dx modified	1	182640023A	09/25/2018 23:59	Marisa Englebright	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWT PH-Dx 06/97	1	182640023A	09/21/2018 20:00	Mathias Okpo	1

**Sample Description:** MW-531-W-180917 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9807870  
**ELLE Group #:** 1988392  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 09/18/2018 10:00  
**Collection Date/Time:** 09/17/2018 08:55

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270D SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14244	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14244	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14244	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14244	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14244	Chrysene	218-01-9	N.D.	0.01	1
14244	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1

The recovery for a target analyte(s) in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary. Since the recovery is high and the target analyte(s) was not detected in the sample, the data is reported.

<b>GC Volatiles</b>		<b>ECY 97-602 NWT PH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWT PH-Gx water C7-C12	n.a.	N.D.	19	1

<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1

<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWT PH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	50	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	110	1

The reverse surrogate, capric acid, is present at <1%.

### Sample Comments

State of Washington Lab Certification No. C457  
Carcinogenic PAHs have been reported for this sample

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	18262WAC026	09/20/2018 22:32	Brandon K Cordova	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18262WAC026	09/20/2018 08:00	Logan M Brosemer	1
08274	NWT PH-Gx water C7-C12	ECY 97-602 NWT PH-Gx	1	18262B94A	09/22/2018 04:42	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18262B94A	09/22/2018 04:42	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18262B94A	09/22/2018 04:42	Jeremy C Giffin	1
12917	NWT PH-Dx water w/Si Gel	ECY 97-602 NWT PH-Dx modified	1	182640023A	09/26/2018 00:22	Marisa Englebright	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWT PH-Dx 06/97	1	182640023A	09/21/2018 20:00	Mathias Okpo	1

**Sample Description:** MW-532-W-180917 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9807871  
**ELLE Group #:** 1988392  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 09/18/2018 10:00  
**Collection Date/Time:** 09/17/2018 10:15

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270D SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14244	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14244	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14244	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14244	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14244	Chrysene	218-01-9	N.D.	0.01	1
14244	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1

The recovery for a target analyte(s) in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary. Since the recovery is high and the target analyte(s) was not detected in the sample, the data is reported.

<b>GC Volatiles</b>		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	19	1

<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1

<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	48	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	110	1

The reverse surrogate, capric acid, is present at <1%.

### Sample Comments

State of Washington Lab Certification No. C457  
Carcinogenic PAHs have been reported for this sample

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	18262WAC026	09/20/2018 23:00	Brandon K Cordova	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18262WAC026	09/20/2018 08:00	Logan M Brosemer	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18262B94A	09/22/2018 05:08	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18262B94A	09/22/2018 05:08	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18262B94A	09/22/2018 05:08	Jeremy C Giffin	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	182640023A	09/26/2018 00:45	Marisa Englebright	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	182640023A	09/21/2018 20:00	Mathias Okpo	1



**Sample Description:** MW-533-W-180917 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9807872  
**ELLE Group #:** 1988392  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 09/18/2018 10:00  
**Collection Date/Time:** 09/17/2018 11:40

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270D SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14244	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14244	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14244	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14244	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14244	Chrysene	218-01-9	N.D.	0.01	1
14244	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1

The recovery for a target analyte(s) in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary. Since the recovery is high and the target analyte(s) was not detected in the sample, the data is reported.

<b>GC Volatiles</b>		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	19	1

<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1

<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	50	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	110	1

The reverse surrogate, capric acid, is present at <1%.

### Sample Comments

State of Washington Lab Certification No. C457  
Carcinogenic PAHs have been reported for this sample

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	18262WAC026	09/20/2018 23:28	Brandon K Cordova	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18262WAC026	09/20/2018 08:00	Logan M Brosemer	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18262B94A	09/22/2018 05:33	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18262B94A	09/22/2018 05:33	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18262B94A	09/22/2018 05:33	Jeremy C Giffin	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	182640023A	09/26/2018 01:08	Marisa Englebright	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	182640023A	09/21/2018 20:00	Mathias Okpo	1

**Sample Description:** MW-534-W-180917 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9807873  
**ELLE Group #:** 1988392  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 09/18/2018 10:00  
**Collection Date/Time:** 09/17/2018 11:50

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270D SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14244	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14244	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14244	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14244	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14244	Chrysene	218-01-9	N.D.	0.01	1
14244	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1

The recovery for a target analyte(s) in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary. Since the recovery is high and the target analyte(s) was not detected in the sample, the data is reported.

<b>GC Volatiles</b>		<b>ECY 97-602 NWT PH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWT PH-Gx water C7-C12	n.a.	N.D.	19	1

<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1

<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWT PH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	47	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1

The reverse surrogate, capric acid, is present at <1%.

### Sample Comments

State of Washington Lab Certification No. C457  
Carcinogenic PAHs have been reported for this sample

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	18262WAC026	09/20/2018 23:56	Brandon K Cordova	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18262WAC026	09/20/2018 08:00	Logan M Brosemer	1
08274	NWT PH-Gx water C7-C12	ECY 97-602 NWT PH-Gx	1	18262B94A	09/22/2018 05:59	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18262B94A	09/22/2018 05:59	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18262B94A	09/22/2018 05:59	Jeremy C Giffin	1
12917	NWT PH-Dx water w/Si Gel	ECY 97-602 NWT PH-Dx modified	1	182640024A	09/27/2018 12:30	Marisa Englebright	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWT PH-Dx 06/97	1	182640024A	09/21/2018 20:00	Mathias Okpo	1

**Sample Description:** MW-535-W-180917 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9807874  
**ELLE Group #:** 1988392  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 09/18/2018 10:00  
**Collection Date/Time:** 09/17/2018 10:55

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270D SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14244	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14244	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14244	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14244	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14244	Chrysene	218-01-9	N.D.	0.01	1
14244	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1

The recovery for a target analyte(s) in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary. Since the recovery is high and the target analyte(s) was not detected in the sample, the data is reported.

<b>GC Volatiles</b>		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	19	1

<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1

<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	49	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	110	1

The reverse surrogate, capric acid, is present at <1%.

### Sample Comments

State of Washington Lab Certification No. C457  
Carcinogenic PAHs have been reported for this sample

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	18262WAC026	09/21/2018 00:24	Brandon K Cordova	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18262WAC026	09/20/2018 08:00	Logan M Brosemer	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18262B94A	09/22/2018 06:24	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18262B94A	09/22/2018 06:24	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18262B94A	09/22/2018 06:24	Jeremy C Giffin	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	182640024A	09/27/2018 12:53	Marisa Englebright	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	182640024A	09/21/2018 20:00	Mathias Okpo	1

**Sample Description:** DUP-1-WD-180917 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9807875  
**ELLE Group #:** 1988392  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 09/18/2018 10:00  
**Collection Date/Time:** 09/17/2018

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270D SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14244	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14244	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14244	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14244	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14244	Chrysene	218-01-9	N.D.	0.01	1
14244	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1

The recovery for a target analyte(s) in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary. Since the recovery is high and the target analyte(s) was not detected in the sample, the data is reported.

<b>GC Volatiles</b>		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	19	1

<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1

<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	49	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	110	1

The reverse surrogate, capric acid, is present at <1%.

### Sample Comments

State of Washington Lab Certification No. C457  
Carcinogenic PAHs have been reported for this sample

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	18262WAC026	09/21/2018 00:52	Brandon K Cordova	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18262WAC026	09/20/2018 08:00	Logan M Brosemer	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18262B94A	09/22/2018 06:50	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18262B94A	09/22/2018 06:50	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18262B94A	09/22/2018 06:50	Jeremy C Giffin	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	182640024A	09/27/2018 13:16	Marisa Englebright	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	182640024A	09/21/2018 20:00	Mathias Okpo	1

**Sample Description:** QA-T-180917 NA Water  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9807876  
**ELLE Group #:** 1988392  
**Matrix:** Water

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 09/18/2018 10:00  
**Collection Date/Time:** 09/17/2018

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC Volatiles</b>					
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx n.a.	ug/l N.D.	ug/l 19	1
<b>GC Volatiles</b>					
02102	Benzene	SW-846 8021B 71-43-2	ug/l N.D.	ug/l 0.5	1

### Sample Comments

State of Washington Lab Certification No. C457

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18262B94A	09/21/2018 22:44	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18262B94A	09/21/2018 22:44	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18262B94A	09/21/2018 22:44	Jeremy C Giffin	1

## Quality Control Summary

Client Name: Chevron Environmental Mgmt Co  
Reported: 09/30/2018 20:15

Group Number: 1988392

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

### Method Blank

Analysis Name	Result ug/l	MDL ug/l
Batch number: 18262WAC026	Sample number(s): 9807865,9807867,9807869-9807875	
Benzo(a)anthracene	N.D.	0.01
Benzo(a)pyrene	N.D.	0.01
Benzo(b)fluoranthene	N.D.	0.01
Benzo(k)fluoranthene	N.D.	0.01
Chrysene	N.D.	0.01
Dibenz(a,h)anthracene	N.D.	0.02
Indeno(1,2,3-cd)pyrene	N.D.	0.01
Batch number: 18264WAM026	Sample number(s): 9807866,9807868	
Benzo(a)anthracene	N.D.	0.01
Benzo(a)pyrene	N.D.	0.01
Benzo(b)fluoranthene	N.D.	0.01
Benzo(k)fluoranthene	N.D.	0.01
Chrysene	N.D.	0.01
Dibenz(a,h)anthracene	N.D.	0.02
Indeno(1,2,3-cd)pyrene	N.D.	0.01
Batch number: 18262B94A	Sample number(s): 9807865-9807876	
Benzene	N.D.	0.03
NWTPH-Gx water C7-C12	N.D.	19
Batch number: 182640023A	Sample number(s): 9807865-9807872	
DX DRO C12-C24 w/ SiGel	N.D.	45
DX HRO C24-C40 w/ SiGel	N.D.	100
Batch number: 182640024A	Sample number(s): 9807873-9807875	
DX DRO C12-C24 w/ SiGel	N.D.	45
DX HRO C24-C40 w/ SiGel	N.D.	100

### LCS/LCSD

Analysis Name	LCS Spike Added ug/l	LCS Conc ug/l	LCSD Spike Added ug/l	LCSD Conc ug/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: 18262WAC026	Sample number(s): 9807865,9807867,9807869-9807875								
Benzo(a)anthracene	1.00	1.13			113*		67-111		
Benzo(a)pyrene	1.00	1.17			117		69-121		

\*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

## Quality Control Summary

Client Name: Chevron Environmental Mgmt Co  
Reported: 09/30/2018 20:15

Group Number: 1988392

### LCS/LCSD (continued)

Analysis Name	LCS Spike Added ug/l	LCS Conc ug/l	LCSD Spike Added ug/l	LCSD Conc ug/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Benzo(b)fluoranthene	1.00	1.18			118		70-123		
Benzo(k)fluoranthene	1.00	1.21			121*		66-120		
Chrysene	1.00	1.18			118*		66-109		
Dibenz(a,h)anthracene	1.00	1.15			115		55-123		
Indeno(1,2,3-cd)pyrene	1.00	1.13			113		52-124		
Batch number: 18264WAM026	Sample number(s): 9807866,9807868								
Benzo(a)anthracene	1.00	1.17			117*		67-111		
Benzo(a)pyrene	1.00	1.12			112		69-121		
Benzo(b)fluoranthene	1.00	1.16			116		70-123		
Benzo(k)fluoranthene	1.00	1.11			111		66-120		
Chrysene	1.00	1.05			105		66-109		
Dibenz(a,h)anthracene	1.00	1.09			109		55-123		
Indeno(1,2,3-cd)pyrene	1.00	1.17			117		52-124		
	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>					
Batch number: 18262B94A	Sample number(s): 9807865-9807876								
Benzene	20	20.25	20	19.77	101	99	80-120	2	30
NWTPH-Gx water C7-C12	1100	1385.55	1100	1386.17	126	126	64-131	0	30
	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>					
Batch number: 182640023A	Sample number(s): 9807865-9807872								
DX DRO C12-C24 w/ SiGel	602.24	196.5	602.24	233.8	33	39	10-115	17	20
Batch number: 182640024A	Sample number(s): 9807873-9807875								
DX DRO C12-C24 w/ SiGel	602.24	237.39			39		10-115		

### Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: SIM SVOAs 8270D MINI  
Batch number: 18262WAC026

	Fluoranthene-d10	Benzo(a)pyrene-d12	1-Methylnaphthalene-d10
9807865	93	90	93
9807867	90	95	87
9807869	95	96	88
9807870	98	74	78
9807871	101	92	86
9807872	103	70	89
9807873	101	70	87

\*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

## Quality Control Summary

Client Name: Chevron Environmental Mgmt Co  
Reported: 09/30/2018 20:15

Group Number: 1988392

### Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: SIM SVOAs 8270D MINI

Batch number: 18262WAC026

	Fluoranthene-d10	Benzo(a)pyrene-d12	1-Methylnaphthalene-d10
9807874	97	74	81
9807875	98	73	78
Blank	114	110	95
LCS	100	97	91
Limits:	38-119	18-129	29-112

Analysis Name: SIM SVOAs 8270D MINI

Batch number: 18264WAM026

	Fluoranthene-d10	Benzo(a)pyrene-d12	1-Methylnaphthalene-d10
9807866	80	53	66
9807868	102	91	67
Blank	106	105	51
LCS	86	99	48
Limits:	38-119	18-129	29-112

Analysis Name: Method 8021 Water Master

Batch number: 18262B94A

	Trifluorotoluene-P	Trifluorotoluene-F
9807865	83	88
9807866	84	81
9807867	86	79
9807868	91	84
9807869	83	81
9807870	86	81
9807871	86	90
9807872	80	80
9807873	85	86
9807874	84	79
9807875	85	79
9807876	85	96
Blank	84	81
LCS	84	100
LCSD	84	97
Limits:	51-120	50-150

Analysis Name: NWTPH-Dx water w/Si Gel

Batch number: 182640023A

\*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.



## Quality Control Summary

Client Name: Chevron Environmental Mgmt Co  
Reported: 09/30/2018 20:15

Group Number: 1988392

### Surrogate Quality Control (continued)

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: NWTPH-Dx water w/Si Gel  
Batch number: 182640023A

	Orthoterphenyl
9807865	88
9807866	72
9807867	66
9807868	79
9807869	67
9807870	75
9807871	73
9807872	80
Blank	84
LCS	67
LCSD	76

Limits: 50-150

Analysis Name: NWTPH-Dx water w/Si Gel  
Batch number: 182640024A

	Orthoterphenyl
9807873	77
9807874	76
9807875	80
Blank	80
LCS	70

Limits: 50-150

\*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

# Chevron Northwest Region Analysis Request/Chain of Custody



**Lancaster Laboratories**

Acct. # 11964

Group # 1989392

For Lancaster Laboratories use only.  
Sample # 9307865-76

Instructions on reverse side correspond with circled numbers.

1 Client Information			4 Matrix			5 Analyses Requested										6 Remarks	
Facility # <u>Edmonds Terminal</u> WBS <u>NWENVPM6DD1430802</u> Site Address <u>11720 unoco Rd, Edmonds, WA</u> Chevron PM <u>Kim Jolitz</u> Lead Consultant <u>Arceadis</u> Consultant/Office <u>1100 Olive Way, Suite 800, Seattle, WA</u> Consultant Project Mgr. <u>Scott Zorn</u> Consultant Phone # _____			<input type="checkbox"/> Sediment <input checked="" type="checkbox"/> Potable Ground <input type="checkbox"/> Surface <input type="checkbox"/> NPDES <input type="checkbox"/> Air			Total Number of Containers _____ <input checked="" type="checkbox"/> BTEX+MTBE 80215 <input type="checkbox"/> 8260 <input type="checkbox"/> Naphth 8260 full scan _____ Oxygenates _____ NWTPH GX _____ <input checked="" type="checkbox"/> NWTPH DX <input checked="" type="checkbox"/> Silica Gel Cleanup Lead <input type="checkbox"/> Total <input type="checkbox"/> Diss. <input type="checkbox"/> Method _____ WAVPH <input type="checkbox"/> WAEPH <input type="checkbox"/> <u>CPAHS by USEPA 8270SUM</u>										SCR #: _____ <input type="checkbox"/> Results in Dry Weight <input type="checkbox"/> J value reporting needed <input type="checkbox"/> Must meet lowest detection limits possible for 8260 compounds <input type="checkbox"/> 8021 MTBE Confirmation <input type="checkbox"/> Confirm MTBE + Naphthalene <input type="checkbox"/> Confirm highest hit by 8260 <input type="checkbox"/> Confirm all hits by 8260 <input type="checkbox"/> Run _____ oxy's on highest hit <input type="checkbox"/> Run _____ oxy's on all hits	
2 Sample Identification			3 Grab Composite														
Collected Date Time			Grab Composite														
MW-E-R 9/17/18 1235			<input checked="" type="checkbox"/>														
MW-104 0945			<input type="checkbox"/>														
MW-129R 1310			<input type="checkbox"/>														
MW-525 0900			<input type="checkbox"/>														
MW-526 1050			<input type="checkbox"/>														
MW-531 0855			<input type="checkbox"/>														
MW-532 1015			<input type="checkbox"/>														
MW-533 1140			<input type="checkbox"/>														
MW-534 1150			<input type="checkbox"/>														
MW-535 1055			<input type="checkbox"/>														
Dup-1			<input type="checkbox"/>														
Trip Blank			<input type="checkbox"/>														
7 Turnaround Time Requested (TAT) (please circle)			Relinquished by _____ Date _____ Time _____			Received by _____ Date _____ Time _____										9	
Standard 5 day 4 day 72 hour 48 hour 24 hour			Relinquished by _____ Date _____ Time _____			Received by _____ Date _____ Time _____											
8 Data Package Options (please circle if required)			Relinquished by Commerical Carrier:			Received by _____ Date _____ Time _____											
Type I - Full Type VI (Raw Data)			UPS _____ FedEx <input checked="" type="checkbox"/> Other _____			Temperature Upon Receipt <u>1.3-1.6 °C</u> Custody Seals Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No											



Client: Arcadis

### Delivery and Receipt Information

Delivery Method:	<u>Fed Ex</u>	Arrival Timestamp:	<u>09/18/2018 10:00</u>
Number of Packages:	<u>2</u>	Number of Projects:	<u>1</u>
State/Province of Origin:	<u>WA</u>		

### Arrival Condition Summary

Shipping Container Sealed:	Yes	Sample IDs on COC match Containers:	Yes
Custody Seal Present:	Yes	Sample Date/Times match COC:	Yes
Custody Seal Intact:	Yes	VOA Vial Headspace $\geq$ 6mm:	Yes
Samples Chilled:	Yes	VOA IDs ( $\geq$ 6mm):	MW-E-12
Paperwork Enclosed:	Yes	Total Trip Blank Qty:	2
Samples Intact:	Yes	Trip Blank Type:	HCI
Missing Samples:	No	Air Quality Samples Present:	No
Extra Samples:	No		
Discrepancy in Container Qty on COC:	Yes		

*Unpacked by Cory Jeremiah (10469) at 17:19 on 09/18/2018*

### Samples Chilled Details

Thermometer Types: DT = Digital (Temp. Bottle) IR = Infrared (Surface Temp) All Temperatures in °C.

Cooler #	Thermometer ID	Corrected Temp	Therm. Type	Ice Type	Ice Present?	Ice Container	Elevated Temp?
1	DT146	1.3	DT	Wet	Y	Bagged	N
2	DT146	1.6	DT	Wet	Y	Bagged	N

### Container Quantity Discrepancy Details

Sample ID on COC	Container Qty. Received	Container Qty. on COC	Comments
MW-104	8	10	
MW-526	8	10	
MW-531	8	10	
MW-532	8	10	
MW-533	8	10	
MW-534	8	10	
DUP-1	8	10	



Client: Edmunds Terminal

**Delivery and Receipt Information**

Delivery Method:	<u>Fed Ex</u>	Arrival Timestamp:	<u>09/19/2018 10:30</u>
Number of Packages:	<u>1</u>	Number of Projects:	<u>1</u>
State/Province of Origin:	<u>WA</u>		

**Arrival Condition Summary**

Shipping Container Sealed:	Yes	Sample IDs on COC match Containers:	Yes
Custody Seal Present:	Yes	Sample Date/Times match COC:	Yes
Custody Seal Intact:	Yes	VOA Vial Headspace $\geq$ 6mm:	No
Samples Chilled:	Yes	Total Trip Blank Qty:	1
Paperwork Enclosed:	Yes	Trip Blank Type:	HCI
Samples Intact:	Yes	Air Quality Samples Present:	No
Missing Samples:	No		
Extra Samples:	No		
Discrepancy in Container Qty on COC:	No		

*Unpacked by Melvin Sanchez (8943) at 15:32 on 09/19/2018*

**Samples Chilled Details**

Thermometer Types: DT = Digital (Temp. Bottle) IR = Infrared (Surface Temp) All Temperatures in °C.

Cooler #	Thermometer ID	Corrected Temp	Therm. Type	Ice Type	Ice Present?	Ice Container	Elevated Temp?
1	DT131	3.0	DT	Wet	Y	Bagged	N

# Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

<b>BMQL</b>	Below Minimum Quantitation Level	<b>mL</b>	milliliter(s)
<b>C</b>	degrees Celsius	<b>MPN</b>	Most Probable Number
<b>cfu</b>	colony forming units	<b>N.D.</b>	non-detect
<b>CP Units</b>	cobalt-chloroplatinate units	<b>ng</b>	nanogram(s)
<b>F</b>	degrees Fahrenheit	<b>NTU</b>	nephelometric turbidity units
<b>g</b>	gram(s)	<b>pg/L</b>	picogram/liter
<b>IU</b>	International Units	<b>RL</b>	Reporting Limit
<b>kg</b>	kilogram(s)	<b>TNTC</b>	Too Numerous To Count
<b>L</b>	liter(s)	<b>µg</b>	microgram(s)
<b>lb.</b>	pound(s)	<b>µL</b>	microliter(s)
<b>m3</b>	cubic meter(s)	<b>umhos/cm</b>	micromhos/cm
<b>meq</b>	milliequivalents	<b>MCL</b>	Maximum Contamination Limit
<b>mg</b>	milligram(s)		
<b>&lt;</b>	less than		
<b>&gt;</b>	greater than		
<b>ppm</b>	parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.		
<b>ppb</b>	parts per billion		
<b>Dry weight basis</b>	Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.		

**Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.**

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

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Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as "analyze immediately" are not performed within 15 minutes.

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# Data Qualifiers

Qualifier	Definition
C	Result confirmed by reanalysis
D1	Indicates for dual column analyses that the result is reported from column 1
D2	Indicates for dual column analyses that the result is reported from column 2
E	Concentration exceeds the calibration range
K1	Initial Calibration Blank is above the QC limit and the sample result is ND
K2	Continuing Calibration Blank is above the QC limit and the sample result is ND
K3	Initial Calibration Verification is above the QC limit and the sample result is ND
K4	Continuing Calibration Verification is above the QC limit and the sample result is ND
J (or G, I, X)	Estimated value $\geq$ the Method Detection Limit (MDL or DL) and $<$ the Limit of Quantitation (LOQ or RL)
P	Concentration difference between the primary and confirmation column $>40\%$ . The lower result is reported.
P^	Concentration difference between the primary and confirmation column $> 40\%$ . The higher result is reported.
U	Analyte was not detected at the value indicated
V	Concentration difference between the primary and confirmation column $>100\%$ . The reporting limit is raised due to this disparity and evident interference.
W	The dissolved oxygen uptake for the unseeded blank is greater than 0.20 mg/L.
Z	Laboratory Defined - see analysis report

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods. Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.



## ANALYSIS REPORT

Prepared by:

Eurofins Lancaster Laboratories Environmental  
2425 New Holland Pike  
Lancaster, PA 17601

Prepared for:

Chevron Environmental Mgmt Co  
BR1 X5139C  
6101 Bollinger Canyon Road  
San Ramon CA 94583

Report Date: October 04, 2018 14:43

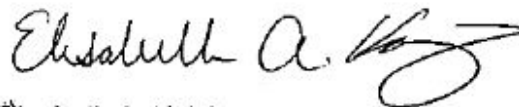
### Project: Edmonds Terminal

Account #: 11964  
Group Number: 1989359  
PO Number: 0015268291  
Release Number: JOLITZ  
State of Sample Origin: WA

Electronic Copy To Arcadis  
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Electronic Copy To Arcadis

Attn: Scott Zorn  
Attn: Sam Miles  
Attn: Jason Little  
Attn: Ryan Brauchla  
Attn: Ophelie Encelle  
Attn: Eric Krueger

Respectfully Submitted,



Elisabeth A. Knisley  
Project Manager

(717) 556-7262

To view our laboratory's current scopes of accreditation please go to <http://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster-laboratories-environmental/resources/certifications/>. Historical copies may be requested through your project manager.



## SAMPLE INFORMATION

<u>Client Sample Description</u>	<u>Sample Collection Date/Time</u>	<u>ELLE#</u>
MW-8R-W-180918 Grab Groundwater	09/18/2018 09:40	9812221
MW-20R-W-180918 Grab Groundwater	09/18/2018 12:20	9812222
MW-101-W-180918 Grab Groundwater	09/18/2018 13:10	9812223
MW-126-W-180918 Grab Groundwater	09/18/2018 08:15	9812224
MW-126-W-180918 MS Grab Groundwater	09/18/2018 08:15	9812225
MW-126-W-180918 MSD Grab Groundwater	09/18/2018 08:15	9812226
MW-143-W-180918 Grab Groundwater	09/18/2018 08:50	9812227
MW-519-W-180918 Grab Groundwater	09/18/2018 12:00	9812228
MW-520-W-180918 Grab Groundwater	09/18/2018 09:55	9812229
MW-521-W-180918 Grab Groundwater	09/18/2018 10:50	9812230
MW-522-W-180918 Grab Groundwater	09/18/2018 10:55	9812231
DUP-2-WD-180918 Grab Groundwater	09/18/2018	9812232
QA-T-180918 NA Water	09/18/2018	9812233

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.



**Sample Description:** MW-8R-W-180918 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9812221  
**ELLE Group #:** 1989359  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 09/19/2018 10:30

**Collection Date/Time:** 09/18/2018 09:40

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270D SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14244	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14244	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14244	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14244	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14244	Chrysene	218-01-9	N.D.	0.01	1
14244	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
The recovery for a target analyte(s) in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary. Since the recovery is high and the target analyte(s) was not detected in the sample, the data is reported.					
<b>GC Volatiles</b>		<b>ECY 97-602 NWT PH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWT PH-Gx water C7-C12	n.a.	N.D.	19	1
<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1
<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWT PH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	47	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1

### Sample Comments

State of Washington Lab Certification No. C457  
Carcinogenic PAHs have been reported for this sample

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	18268WAB026	09/26/2018 07:57	Catherine E Bachman	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18268WAB026	09/25/2018 17:40	Mathias Okpo	1
08274	NWT PH-Gx water C7-C12	ECY 97-602 NWT PH-Gx	1	18267A94A	09/24/2018 22:12	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18267A94A	09/24/2018 22:12	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18267A94A	09/24/2018 22:12	Jeremy C Giffin	1
12917	NWT PH-Dx water w/Si Gel	ECY 97-602 NWT PH-Dx modified	1	182640024A	09/27/2018 13:38	Marisa Englebright	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWT PH-Dx 06/97	1	182640024A	09/21/2018 20:00	Mathias Okpo	1

**Sample Description:** MW-20R-W-180918 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9812222  
**ELLE Group #:** 1989359  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 09/19/2018 10:30  
**Collection Date/Time:** 09/18/2018 12:20

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270D SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14244	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14244	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14244	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14244	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14244	Chrysene	218-01-9	N.D.	0.01	1
14244	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
The recovery for a target analyte(s) in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary. Since the recovery is high and the target analyte(s) was not detected in the sample, the data is reported.					
<b>GC Volatiles</b>		<b>ECY 97-602 NWT PH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWT PH-Gx water C7-C12	n.a.	N.D.	19	1
<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1
<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWT PH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	50	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	110	1

### Sample Comments

State of Washington Lab Certification No. C457  
Carcinogenic PAHs have been reported for this sample

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	18268WAB026	09/26/2018 08:26	Catherine E Bachman	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18268WAB026	09/25/2018 17:40	Mathias Okpo	1
08274	NWT PH-Gx water C7-C12	ECY 97-602 NWT PH-Gx	1	18267A94A	09/24/2018 22:38	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18267A94A	09/24/2018 22:38	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18267A94A	09/24/2018 22:38	Jeremy C Giffin	1
12917	NWT PH-Dx water w/Si Gel	ECY 97-602 NWT PH-Dx modified	1	182640024A	09/27/2018 14:01	Marisa Englebright	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWT PH-Dx 06/97	1	182640024A	09/21/2018 20:00	Mathias Okpo	1

**Sample Description:** MW-101-W-180918 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9812223  
**ELLE Group #:** 1989359  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 09/19/2018 10:30  
**Collection Date/Time:** 09/18/2018 13:10

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270D SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14244	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14244	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14244	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14244	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14244	Chrysene	218-01-9	N.D.	0.01	1
14244	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
The recovery for a target analyte(s) in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary. Since the recovery is high and the target analyte(s) was not detected in the sample, the data is reported.					
<b>GC Volatiles</b>		<b>ECY 97-602 NWT PH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWT PH-Gx water C7-C12	n.a.	140	19	1
<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1
<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWT PH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	50	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	110	1

### Sample Comments

State of Washington Lab Certification No. C457  
Carcinogenic PAHs have been reported for this sample

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	18268WAB026	09/26/2018 08:55	Catherine E Bachman	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18268WAB026	09/25/2018 17:40	Mathias Okpo	1
08274	NWT PH-Gx water C7-C12	ECY 97-602 NWT PH-Gx	1	18267A94A	09/24/2018 23:04	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18267A94A	09/24/2018 23:04	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18267A94A	09/24/2018 23:04	Jeremy C Giffin	1
12917	NWT PH-Dx water w/Si Gel	ECY 97-602 NWT PH-Dx modified	1	182640024A	09/27/2018 14:23	Marisa Englebright	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWT PH-Dx 06/97	1	182640024A	09/21/2018 20:00	Mathias Okpo	1

**Sample Description:** MW-126-W-180918 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9812224  
**ELLE Group #:** 1989359  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 09/19/2018 10:30  
**Collection Date/Time:** 09/18/2018 08:15

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270D SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14244	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14244	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14244	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14244	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14244	Chrysene	218-01-9	N.D.	0.01	1
14244	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
The recovery for a target analyte(s) in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary. Since the recovery is high and the target analyte(s) was not detected in the sample, the data is reported.					
<b>GC Volatiles</b>		<b>ECY 97-602 NWT PH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWT PH-Gx water C7-C12	n.a.	N.D.	19	1
<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1
<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWT PH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	48	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	110	1

### Sample Comments

State of Washington Lab Certification No. C457  
Carcinogenic PAHs have been reported for this sample

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	18268WAB026	09/26/2018 06:31	Catherine E Bachman	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18268WAB026	09/25/2018 17:40	Mathias Okpo	1
08274	NWT PH-Gx water C7-C12	ECY 97-602 NWT PH-Gx	1	18267A94A	09/24/2018 23:30	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18267A94A	09/24/2018 23:30	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18267A94A	09/24/2018 23:30	Jeremy C Giffin	1
12917	NWT PH-Dx water w/Si Gel	ECY 97-602 NWT PH-Dx modified	1	182640024A	09/27/2018 10:50	Marisa Englebright	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWT PH-Dx 06/97	1	182640024A	09/21/2018 20:00	Mathias Okpo	1

**Sample Description:** MW-126-W-180918 MS Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9812225  
**ELLE Group #:** 1989359  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submittal Date/Time:** 09/19/2018 10:30  
**Collection Date/Time:** 09/18/2018 08:15

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270D SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14244	Benzo(a)anthracene	56-55-3	1	0.01	1
14244	Benzo(a)pyrene	50-32-8	1	0.01	1
14244	Benzo(b)fluoranthene	205-99-2	1	0.01	1
14244	Benzo(k)fluoranthene	207-08-9	1	0.01	1
14244	Chrysene	218-01-9	1	0.01	1
14244	Dibenz(a,h)anthracene	53-70-3	1	0.02	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	1	0.01	1
<b>GC Volatiles</b>		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	1,500	19	1
<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	22	0.5	1
<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	240	48	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	110	1

### Sample Comments

State of Washington Lab Certification No. C457  
Carcinogenic PAHs have been reported for this sample

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	18268WAB026	09/26/2018 07:00	Catherine E Bachman	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18268WAB026	09/25/2018 17:40	Mathias Okpo	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18267A94A	09/25/2018 00:46	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18267A94A	09/24/2018 23:55	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18267A94A	09/24/2018 23:55	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	2	18267A94A	09/25/2018 00:46	Jeremy C Giffin	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	182640024A	09/27/2018 11:45	Marisa Englebright	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	182640024A	09/21/2018 20:00	Mathias Okpo	1

**Sample Description:** MW-126-W-180918 MSD Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9812226  
**ELLE Group #:** 1989359  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submittal Date/Time:** 09/19/2018 10:30  
**Collection Date/Time:** 09/18/2018 08:15

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270D SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14244	Benzo(a)anthracene	56-55-3	1	0.01	1
14244	Benzo(a)pyrene	50-32-8	1	0.01	1
14244	Benzo(b)fluoranthene	205-99-2	1	0.01	1
14244	Benzo(k)fluoranthene	207-08-9	1	0.01	1
14244	Chrysene	218-01-9	1	0.01	1
14244	Dibenz(a,h)anthracene	53-70-3	1	0.02	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	1	0.01	1
<b>GC Volatiles</b>		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	1,500	19	1
<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	22	0.5	1
<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	260	48	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	110	1

### Sample Comments

State of Washington Lab Certification No. C457  
Carcinogenic PAHs have been reported for this sample

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	18268WAB026	09/26/2018 07:28	Catherine E Bachman	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18268WAB026	09/25/2018 17:40	Mathias Okpo	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18267A94A	09/25/2018 01:12	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18267A94A	09/25/2018 00:21	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18267A94A	09/25/2018 00:21	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	2	18267A94A	09/25/2018 01:12	Jeremy C Giffin	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	182640024A	09/27/2018 12:08	Marisa Englebright	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	182640024A	09/21/2018 20:00	Mathias Okpo	1

**Sample Description:** MW-143-W-180918 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9812227  
**ELLE Group #:** 1989359  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submittal Date/Time:** 09/19/2018 10:30  
**Collection Date/Time:** 09/18/2018 08:50

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270D SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14244	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14244	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14244	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14244	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14244	Chrysene	218-01-9	N.D.	0.01	1
14244	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	19	1
<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1
<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	48	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	110	1

### Sample Comments

State of Washington Lab Certification No. C457  
Carcinogenic PAHs have been reported for this sample

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	18267WAH026	09/26/2018 15:04	Kira N Beck	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18267WAH026	09/25/2018 08:00	Logan M Brosemer	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18267A94A	09/25/2018 02:28	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18267A94A	09/25/2018 02:28	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18267A94A	09/25/2018 02:28	Jeremy C Giffin	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	182640024A	09/27/2018 14:46	Marisa Englebright	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	182640024A	09/21/2018 20:00	Mathias Okpo	1

**Sample Description:** MW-519-W-180918 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9812228  
**ELLE Group #:** 1989359  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 09/19/2018 10:30  
**Collection Date/Time:** 09/18/2018 12:00

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270D SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14244	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14244	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14244	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14244	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14244	Chrysene	218-01-9	N.D.	0.01	1
14244	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	19	1
<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1
<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	47	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1

### Sample Comments

State of Washington Lab Certification No. C457  
Carcinogenic PAHs have been reported for this sample

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	18267WAH026	09/26/2018 15:32	Kira N Beck	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18267WAH026	09/25/2018 08:00	Logan M Brosemer	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18267A94A	09/25/2018 02:54	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18267A94A	09/25/2018 02:54	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18267A94A	09/25/2018 02:54	Jeremy C Giffin	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	182640024A	09/27/2018 15:09	Marisa Englebright	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	182640024A	09/21/2018 20:00	Mathias Okpo	1



**Sample Description:** MW-520-W-180918 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9812229  
**ELLE Group #:** 1989359  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 09/19/2018 10:30  
**Collection Date/Time:** 09/18/2018 09:55

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270D SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14244	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14244	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14244	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14244	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14244	Chrysene	218-01-9	N.D.	0.01	1
14244	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	19	1
<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1
<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	46	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1

### Sample Comments

State of Washington Lab Certification No. C457  
Carcinogenic PAHs have been reported for this sample

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	18267WAH026	09/26/2018 16:00	Kira N Beck	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18267WAH026	09/25/2018 08:00	Logan M Brosemer	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18267A94A	09/25/2018 03:20	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18267A94A	09/25/2018 03:20	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18267A94A	09/25/2018 03:20	Jeremy C Giffin	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	182640024A	09/27/2018 15:31	Marisa Englebright	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	182640024A	09/21/2018 20:00	Mathias Okpo	1

**Sample Description:** MW-521-W-180918 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9812230  
**ELLE Group #:** 1989359  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 09/19/2018 10:30  
**Collection Date/Time:** 09/18/2018 10:50

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270D SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14244	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14244	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14244	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14244	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14244	Chrysene	218-01-9	N.D.	0.01	1
14244	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	19	1
<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1
<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	46	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1
The reverse surrogate, capric acid, is present at <1%.					

### Sample Comments

State of Washington Lab Certification No. C457  
Carcinogenic PAHs have been reported for this sample

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	18267WAH026	09/26/2018 16:28	Kira N Beck	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18267WAH026	09/25/2018 08:00	Logan M Brosemer	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18267A94A	09/25/2018 03:46	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18267A94A	09/25/2018 03:46	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18267A94A	09/25/2018 03:46	Jeremy C Giffin	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	182690009A	10/02/2018 01:10	Amy Lehr	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	182690009A	09/26/2018 19:30	Oswaldo R Sanchez	1

**Sample Description:** MW-522-W-180918 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9812231  
**ELLE Group #:** 1989359  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 09/19/2018 10:30  
**Collection Date/Time:** 09/18/2018 10:55

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270D SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14244	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14244	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14244	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14244	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14244	Chrysene	218-01-9	N.D.	0.01	1
14244	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	19	1
<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1
<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	48	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	110	1
The reverse surrogate, capric acid, is present at <1%.					

### Sample Comments

State of Washington Lab Certification No. C457  
Carcinogenic PAHs have been reported for this sample

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	18267WAH026	09/26/2018 16:56	Kira N Beck	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18267WAH026	09/25/2018 08:00	Logan M Brosemer	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18267A94A	09/25/2018 04:11	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18267A94A	09/25/2018 04:11	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18267A94A	09/25/2018 04:11	Jeremy C Giffin	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	182690009A	10/02/2018 01:33	Amy Lehr	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	182690009A	09/26/2018 19:30	Oswaldo R Sanchez	1

**Sample Description:** DUP-2-WD-180918 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9812232  
**ELLE Group #:** 1989359  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 09/19/2018 10:30  
**Collection Date/Time:** 09/18/2018

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270D SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14244	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14244	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14244	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14244	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14244	Chrysene	218-01-9	N.D.	0.01	1
14244	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	140	19	1
<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1
<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	47	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1
The reverse surrogate, capric acid, is present at <1%.					

### Sample Comments

State of Washington Lab Certification No. C457  
Carcinogenic PAHs have been reported for this sample

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	18267WAH026	09/26/2018 17:25	Kira N Beck	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18267WAH026	09/25/2018 08:00	Logan M Brosemer	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18267A94A	09/25/2018 04:37	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18267A94A	09/25/2018 04:37	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18267A94A	09/25/2018 04:37	Jeremy C Giffin	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	182690009A	10/02/2018 01:57	Amy Lehr	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	182690009A	09/26/2018 19:30	Oswaldo R Sanchez	1

**Sample Description:** QA-T-180918 NA Water  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9812233  
**ELLE Group #:** 1989359  
**Matrix:** Water

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 09/19/2018 10:30  
**Collection Date/Time:** 09/18/2018

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC Volatiles</b>					
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx n.a.	ug/l N.D.	ug/l 19	1
<b>GC Volatiles</b>					
02102	Benzene	SW-846 8021B 71-43-2	ug/l N.D.	ug/l 0.5	1

### Sample Comments

State of Washington Lab Certification No. C457

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18267A94A	09/24/2018 21:47	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18267A94A	09/24/2018 21:47	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18267A94A	09/24/2018 21:47	Jeremy C Giffin	1

## Quality Control Summary

Client Name: Chevron Environmental Mgmt Co  
Reported: 10/04/2018 14:43

Group Number: 1989359

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

### Method Blank

Analysis Name	Result ug/l	MDL ug/l
Batch number: 18267WAH026	Sample number(s): 9812227-9812232	
Benzo(a)anthracene	N.D.	0.01
Benzo(a)pyrene	N.D.	0.01
Benzo(b)fluoranthene	N.D.	0.01
Benzo(k)fluoranthene	N.D.	0.01
Chrysene	N.D.	0.01
Dibenz(a,h)anthracene	N.D.	0.02
Indeno(1,2,3-cd)pyrene	N.D.	0.01
Batch number: 18268WAB026	Sample number(s): 9812221-9812226	
Benzo(a)anthracene	N.D.	0.01
Benzo(a)pyrene	N.D.	0.01
Benzo(b)fluoranthene	N.D.	0.01
Benzo(k)fluoranthene	N.D.	0.01
Chrysene	N.D.	0.01
Dibenz(a,h)anthracene	N.D.	0.02
Indeno(1,2,3-cd)pyrene	N.D.	0.01
Batch number: 18267A94A	Sample number(s): 9812221-9812233	
Benzene	N.D.	0.03
NWTPH-Gx water C7-C12	N.D.	19
Batch number: 182640024A	Sample number(s): 9812221-9812229	
DX DRO C12-C24 w/ SiGel	N.D.	45
DX HRO C24-C40 w/ SiGel	N.D.	100
Batch number: 182690009A	Sample number(s): 9812230-9812232	
DX DRO C12-C24 w/ SiGel	N.D.	45
DX HRO C24-C40 w/ SiGel	N.D.	100

### LCS/LCSD

Analysis Name	LCS Spike Added ug/l	LCS Conc ug/l	LCSD Spike Added ug/l	LCSD Conc ug/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: 18267WAH026	Sample number(s): 9812227-9812232								
Benzo(a)anthracene	1.00	1.13			113*		67-111		
Benzo(a)pyrene	1.00	1.18			118		69-121		

\*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

## Quality Control Summary

Client Name: Chevron Environmental Mgmt Co  
Reported: 10/04/2018 14:43

Group Number: 1989359

### LCS/LCSD (continued)

Analysis Name	LCS Spike Added ug/l	LCS Conc ug/l	LCSD Spike Added ug/l	LCSD Conc ug/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Benzo(b)fluoranthene	1.00	1.18			118		70-123		
Benzo(k)fluoranthene	1.00	1.23			123*		66-120		
Chrysene	1.00	1.17			117*		66-109		
Dibenz(a,h)anthracene	1.00	1.24			124*		55-123		
Indeno(1,2,3-cd)pyrene	1.00	1.20			120		52-124		
Batch number: 18268WAB026	Sample number(s): 9812221-9812226								
Benzo(a)anthracene	1.00	1.14			114*		67-111		
Benzo(a)pyrene	1.00	1.10			110		69-121		
Benzo(b)fluoranthene	1.00	1.17			117		70-123		
Benzo(k)fluoranthene	1.00	1.06			106		66-120		
Chrysene	1.00	0.984			98		66-109		
Dibenz(a,h)anthracene	1.00	1.10			110		55-123		
Indeno(1,2,3-cd)pyrene	1.00	1.15			115		52-124		
	ug/l	ug/l	ug/l	ug/l					
Batch number: 18267A94A	Sample number(s): 9812221-9812233								
Benzene	20	19.95			100		80-120		
NWTPH-Gx water C7-C12	1100	1418.09			129		64-131		
	ug/l	ug/l	ug/l	ug/l					
Batch number: 182640024A	Sample number(s): 9812221-9812229								
DX DRO C12-C24 w/ SiGel	602.24	237.39			39		10-115		
Batch number: 182690009A	Sample number(s): 9812230-9812232								
DX DRO C12-C24 w/ SiGel	602.24	174.36	602.24	228.95	29	38	10-115	27*	20

### MS/MSD

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc ug/l	MS Spike Added ug/l	MS Conc ug/l	MSD Spike Added ug/l	MSD Conc ug/l	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Batch number: 18268WAB026	Sample number(s): 9812221-9812226 UNSPK: 9812224									
Benzo(a)anthracene	N.D.	1.06	1.25	1.07	1.29	118*	121*	67-111	3	30
Benzo(a)pyrene	N.D.	1.06	1.21	1.07	1.22	114	114	69-121	1	30
Benzo(b)fluoranthene	N.D.	1.06	1.20	1.07	1.23	113	115	70-123	2	30
Benzo(k)fluoranthene	N.D.	1.06	1.15	1.07	1.14	109	107	66-120	1	30
Chrysene	N.D.	1.06	1.06	1.07	1.10	100	103	66-109	4	30
Dibenz(a,h)anthracene	N.D.	1.06	1.13	1.07	1.20	107	112	55-123	5	30
Indeno(1,2,3-cd)pyrene	N.D.	1.06	1.19	1.07	1.27	113	119	52-124	6	30

\*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

## Quality Control Summary

Client Name: Chevron Environmental Mgmt Co  
Reported: 10/04/2018 14:43

Group Number: 1989359

### MS/MSD (continued)

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc ug/l	MS Spike Added ug/l	MS Conc ug/l	MSD Spike Added ug/l	MSD Conc ug/l	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Batch number: 18267A94A										
Benzene	N.D.	20	21.85	20	21.72	109	109	80-120	1	30
NWTPH-Gx water C7-C12	N.D.	1100	1474.31	1100	1492.41	134*	136*	64-131	1	30
Batch number: 182640024A										
DX DRO C12-C24 w/ SiGel	N.D.	648.96	235.28	648.96	255.75	36	39	30-115	8	20

### Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: SIM SVOAs 8270D MINI  
Batch number: 18267WAH026

	Fluoranthene-d10	Benzo(a)pyrene-d12	1-Methylnaphthalene-d10
9812227	86	87	81
9812228	89	74	82
9812229	83	65	77
9812230	91	61	82
9812231	92	67	66
9812232	88	64	97
Blank	83	87	72
LCS	97	103	91
Limits:	38-119	18-129	29-112

Analysis Name: SIM SVOAs 8270D MINI  
Batch number: 18268WAB026

	Fluoranthene-d10	Benzo(a)pyrene-d12	1-Methylnaphthalene-d10
9812221	84	68	76
9812222	78	77	73
9812223	93	69	87
9812224	86	95	80
9812225	84	104	84
9812226	106	103	86
Blank	116	113	84
LCS	84	101	82

\*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.



## Quality Control Summary

Client Name: Chevron Environmental Mgmt Co  
Reported: 10/04/2018 14:43

Group Number: 1989359

### Surrogate Quality Control (continued)

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: SIM SVOAs 8270D MINI

Batch number: 18268WAB026

	Fluoranthene-d10	Benzo(a)pyrene-d12	1-Methylnaphthalene-d10
MS	84	104	84
MSD	106	103	86
Limits:	38-119	18-129	29-112

Analysis Name: Method 8021 Water Master

Batch number: 18267A94A

	Trifluorotoluene-P	Trifluorotoluene-F
9812221	87	79
9812222	89	85
9812223	86	79
9812224	87	78
9812225	85	98
9812226	85	97
9812227	87	79
9812228	87	79
9812229	88	79
9812230	88	79
9812231	88	80
9812232	87	80
9812233	87	92
Blank	87	82
LCS	85	99
MS	85	98
MSD	85	97
Limits:	51-120	50-150

Analysis Name: NWTPH-Dx water w/Si Gel

Batch number: 182640024A

	Orthoterphenyl
9812221	80
9812222	70
9812223	76
9812224	76
9812225	69
9812226	74
9812227	64
9812228	79
9812229	74
Blank	80
LCS	70

\*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

## Quality Control Summary

Client Name: Chevron Environmental Mgmt Co  
Reported: 10/04/2018 14:43

Group Number: 1989359

### Surrogate Quality Control (continued)

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: NWTPH-Dx water w/Si Gel

Batch number: 182640024A

Orthoterphenyl

MS	69
----	----

MSD	74
-----	----

Limits: 50-150

Analysis Name: NWTPH-Dx water w/Si Gel

Batch number: 182690009A

Orthoterphenyl

9812230	66
---------	----

9812231	70
---------	----

9812232	69
---------	----

Blank	67
-------	----

LCS	50
-----	----

LCSD	65
------	----

Limits: 50-150

\*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

# Chevron Northwest Region Analysis Request/Chain of Custody



**Lancaster Laboratories**

Acct. # 11964

Group # 1459359

For Lancaster Laboratories use only

Sample # 9812221-33

Instructions on reverse side correspond with circled numbers.

1 Client Information			4 Matrix			5 Analyses Requested										SCR #: _____						
Facility # <u>Edmonds Terminal</u> WBS <u>NWENVPMG001430802</u>			<input type="checkbox"/> Sediment <input checked="" type="checkbox"/> Potable <input type="checkbox"/> Ground <input type="checkbox"/> Surface <input type="checkbox"/> NPDES <input type="checkbox"/> Air	<input type="checkbox"/> Soil <input type="checkbox"/> Water <input type="checkbox"/> Oil	Total Number of Containers BTEX-MTBE <input checked="" type="checkbox"/> 8021 <input type="checkbox"/> 8260 8260 full scan Oxygenates NMTPH GX NMTPH DX <input type="checkbox"/> Silica Gel Cleanup <input checked="" type="checkbox"/> Lead, Total <input type="checkbox"/> Method WAVPH <input type="checkbox"/> WAEPH CPAHS by USEPA 8260 SIM											<input type="checkbox"/> Results in Dry Weight <input type="checkbox"/> J value reporting needed <input type="checkbox"/> Must meet lowest detection limits possible for 8260 compounds <input type="checkbox"/> 8021 MTBE Confirmation <input type="checkbox"/> Confirm MTBE + Naphthalene <input type="checkbox"/> Confirm highest hit by 8260 <input type="checkbox"/> Confirm all hits by 8260 <input type="checkbox"/> Run ___ oxy's on highest hit <input type="checkbox"/> Run ___ oxy's on all hits						
Site Address <u>11720 UNCO RD, Edmonds, WA</u>																						
Chevron PM <u>Kim Jolitz</u> Lead Consultant <u>Arcadis</u>																						
Consultant/Office <u>1100 Olive way, suite 800, Seattle, WA</u>																						
Consultant Project Mgr. <u>Scott Zorn</u>																						
Consultant Phone # _____													6 <b>Remarks</b> <u>* use standard silica gel cleanup</u>									
Sampler <u>Eric Krueger &amp; Jason Little</u>																						
2 Sample Identification		3 Collected																				
Date	Time	Grab	Composite																			
<u>9/18/18</u>	<u>0940</u>			<u>10</u>	<input checked="" type="checkbox"/>																	
	<u>1220</u>			<u>10</u>	<input checked="" type="checkbox"/>																	
	<u>1310</u>			<u>10</u>	<input checked="" type="checkbox"/>																	
	<u>0815</u>			<u>10</u>	<input checked="" type="checkbox"/>																	
	<u>0815</u>			<u>20</u>	<input checked="" type="checkbox"/>																	
	<u>0850</u>			<u>10</u>	<input checked="" type="checkbox"/>																	
	<u>1200</u>			<u>10</u>	<input checked="" type="checkbox"/>																	
	<u>0955</u>			<u>10</u>	<input checked="" type="checkbox"/>																	
	<u>1050</u>			<u>10</u>	<input checked="" type="checkbox"/>																	
	<u>1055</u>			<u>10</u>	<input checked="" type="checkbox"/>																	
	<u>DUP-2</u>	<u>▽</u>		<u>10</u>	<input checked="" type="checkbox"/>																	
	<u>Trip Blank</u>	<u>→</u>		<u>3</u>	<input checked="" type="checkbox"/>																	
7 <b>Turnaround Time Requested (TAT)</b> (please circle)				Relinquished by <u>[Signature]</u>			Date <u>9/18/18</u>	Time <u>1545</u>	Received by <u>[Signature]</u>			Date	Time									
<input checked="" type="radio"/> Standard 5 day <input type="radio"/> 72 hour <input type="radio"/> 48 hour <input type="radio"/> 24 hour				Relinquished by _____			Date _____	Time _____	Received by _____			Date _____	Time _____									
8 <b>Data Package Options</b> (please circle if required)				Relinquished by Commerical Carrier:				Received by <u>[Signature]</u>			Date <u>9/20/18</u>	Time <u>1020</u>										
<input checked="" type="radio"/> Type I - Full <input type="radio"/> Type VI (Raw Data)				UPS _____ FedEx <input checked="" type="checkbox"/> Other _____ Temperature Upon Receipt <u>0.6 °C</u>				Custody Seals Intact? <input checked="" type="radio"/> Yes <input type="radio"/> No			Date	Time										



Client: Arcadis

**Delivery and Receipt Information**

Delivery Method: Fed Ex                      Arrival Timestamp: 09/19/2018 10:30  
 Number of Packages: 2                      Number of Projects: 1

**Arrival Condition Summary**

Shipping Container Sealed:	Yes	Sample IDs on COC match Containers:	N/A
Custody Seal Present:	Yes	Sample Date/Times match COC:	N/A
Custody Seal Intact:	Yes	VOA Vial Headspace $\geq$ 6mm:	N/A
Samples Chilled:	Yes	Total Trip Blank Qty:	2
Paperwork Enclosed:	No	Trip Blank Type:	HCl
Samples Intact:	Yes	Air Quality Samples Present:	No
Missing Samples:	No		
Extra Samples:	No		
Discrepancy in Container Qty on COC:	N/A		

*Unpacked by Melvin Sanchez (8943) at 16:08 on 09/19/2018*

**Samples Chilled Details**

Thermometer Types:    DT = Digital (Temp. Bottle)    IR = Infrared (Surface Temp)    All Temperatures in °C.

Cooler #	Thermometer ID	Corrected Temp	Therm. Type	Ice Type	Ice Present?	Ice Container	Elevated Temp?
1	DT131	1.1	DT	Wet	Y	Bagged	N
2	DT131	0.4	DT	Wet	Y	Bagged	N

# Sample Administration Receipt Documentation Log



Client: Arcadis

## Paperwork Not Enclosed Details

<u>Sample ID on Label</u>	<u>No. of Containers</u>	<u>Date on Label</u>	<u>Comments</u>
MW-126	4	9/18/2018 08:15	
MW-126 MS	4	9/18/2018 08:15	
MW-126 MSD	4	9/18/2018 08:15	
MW-143	4	9/18/2018 08:50	
MW-8R	4	9/18/2018 09:40	
MW-520	4	9/18/2018 09:55	
MW-521	4	9/18/2018 10:50	
MW-522	4	9/18/2018 10:55	
MW-519	4	9/18/2018 12:00	
MW-20R	4	9/18/2018 12:20	
MW-101	4	9/18/2018 13:10	
Dup-2	4	9/18/2018 –	
Trip Blank	2	9/11/2018 –	



Client: Arcadis

**Delivery and Receipt Information**

Delivery Method:	<u>Fed Ex</u>	Arrival Timestamp:	<u>09/20/2018 10:20</u>
Number of Packages:	<u>1</u>	Number of Projects:	<u>1</u>
State/Province of Origin:	<u>WA</u>		

**Arrival Condition Summary**

Shipping Container Sealed:	Yes	Sample IDs on COC match Containers:	Yes
Custody Seal Present:	Yes	Sample Date/Times match COC:	Yes
Custody Seal Intact:	Yes	VOA Vial Headspace ≥ 6mm:	No
Samples Chilled:	Yes	Total Trip Blank Qty:	1
Paperwork Enclosed:	Yes	Trip Blank Type:	HCl
Samples Intact:	Yes	Air Quality Samples Present:	No
Missing Samples:	No		
Extra Samples:	No		
Discrepancy in Container Qty on COC:	No		

*Unpacked by Wesley Miller (2308) at 13:02 on 09/20/2018*

**Samples Chilled Details**

Thermometer Types: DT = Digital (Temp. Bottle) IR = Infrared (Surface Temp) All Temperatures in °C.

Cooler #	Thermometer ID	Corrected Temp	Therm. Type	Ice Type	Ice Present?	Ice Container	Elevated Temp?
1	DT42-03	0.6	DT	Wet	Y	Bagged	N

General Comments: Received missing cooler from 9/19/18 shipment

# Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

<b>BMQL</b>	Below Minimum Quantitation Level	<b>mL</b>	milliliter(s)
<b>C</b>	degrees Celsius	<b>MPN</b>	Most Probable Number
<b>cfu</b>	colony forming units	<b>N.D.</b>	non-detect
<b>CP Units</b>	cobalt-chloroplatinate units	<b>ng</b>	nanogram(s)
<b>F</b>	degrees Fahrenheit	<b>NTU</b>	nephelometric turbidity units
<b>g</b>	gram(s)	<b>pg/L</b>	picogram/liter
<b>IU</b>	International Units	<b>RL</b>	Reporting Limit
<b>kg</b>	kilogram(s)	<b>TNTC</b>	Too Numerous To Count
<b>L</b>	liter(s)	<b>µg</b>	microgram(s)
<b>lb.</b>	pound(s)	<b>µL</b>	microliter(s)
<b>m3</b>	cubic meter(s)	<b>umhos/cm</b>	micromhos/cm
<b>meq</b>	milliequivalents	<b>MCL</b>	Maximum Contamination Limit
<b>mg</b>	milligram(s)		
<b>&lt;</b>	less than		
<b>&gt;</b>	greater than		
<b>ppm</b>	parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.		
<b>ppb</b>	parts per billion		
<b>Dry weight basis</b>	Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.		

**Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.**

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

This report shall not be reproduced except in full, without the written approval of the laboratory.

Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as "analyze immediately" are not performed within 15 minutes.

**WARRANTY AND LIMITS OF LIABILITY** - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. THE FOREGOING EXPRESS WARRANTY IS EXCLUSIVE AND IS GIVEN IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. WE DISCLAIM ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING A WARRANTY OF FITNESS FOR PARTICULAR PURPOSE AND WARRANTY OF MERCHANTABILITY. IN NO EVENT SHALL EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL, LLC BE LIABLE FOR INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR LOSS OF PROFIT OR GOODWILL REGARDLESS OF (A) THE NEGLIGENCE (EITHER SOLE OR CONCURRENT) OF EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL AND (B) WHETHER EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL HAS BEEN INFORMED OF THE POSSIBILITY OF SUCH DAMAGES. We accept no legal responsibility for the purposes for which the client uses the test results. No purchase order or other order for work shall be accepted by Eurofins Lancaster Laboratories Environmental which includes any conditions that vary from the Standard Terms and Conditions, and Eurofins Lancaster Laboratories Environmental hereby objects to any conflicting terms contained in any acceptance or order submitted by client.

# Data Qualifiers

Qualifier	Definition
C	Result confirmed by reanalysis
D1	Indicates for dual column analyses that the result is reported from column 1
D2	Indicates for dual column analyses that the result is reported from column 2
E	Concentration exceeds the calibration range
K1	Initial Calibration Blank is above the QC limit and the sample result is ND
K2	Continuing Calibration Blank is above the QC limit and the sample result is ND
K3	Initial Calibration Verification is above the QC limit and the sample result is ND
K4	Continuing Calibration Verification is above the QC limit and the sample result is ND
J (or G, I, X)	Estimated value $\geq$ the Method Detection Limit (MDL or DL) and $<$ the Limit of Quantitation (LOQ or RL)
P	Concentration difference between the primary and confirmation column $>40\%$ . The lower result is reported.
P^	Concentration difference between the primary and confirmation column $> 40\%$ . The higher result is reported.
U	Analyte was not detected at the value indicated
V	Concentration difference between the primary and confirmation column $>100\%$ . The reporting limit is raised due to this disparity and evident interference.
W	The dissolved oxygen uptake for the unseeded blank is greater than 0.20 mg/L.
Z	Laboratory Defined - see analysis report

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods. Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.





## ANALYSIS REPORT

Prepared by:

Eurofins Lancaster Laboratories Environmental  
2425 New Holland Pike  
Lancaster, PA 17601

Prepared for:

Chevron Environmental Mgmt Co  
BR1 X5139C  
6101 Bollinger Canyon Road  
San Ramon CA 94583

Report Date: October 09, 2018 15:20

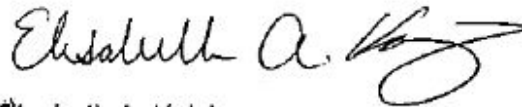
### Project: Edmonds Terminal

Account #: 11964  
Group Number: 1989869  
PO Number: 0015268291  
Release Number: JOLITZ  
State of Sample Origin: WA

Electronic Copy To Arcadis  
Electronic Copy To ARCADIS U.S., Inc.  
Electronic Copy To Arcadis  
Electronic Copy To Arcadis  
Electronic Copy To Arcadis  
Electronic Copy To Arcadis

Attn: Scott Zorn  
Attn: Sam Miles  
Attn: Jason Little  
Attn: Ryan Brauchla  
Attn: Ophelie Encelle  
Attn: Eric Krueger

Respectfully Submitted,



Elisabeth A. Knisley  
Project Manager

(717) 556-7262

To view our laboratory's current scopes of accreditation please go to <http://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster-laboratories-environmental/resources/certifications/>. Historical copies may be requested through your project manager.



## SAMPLE INFORMATION

<u>Client Sample Description</u>	<u>Sample Collection Date/Time</u>	<u>ELLE#</u>
MW-139R-W-180919 Grab Groundwater	09/19/2018 10:50	9814639
MW-506-W-180919 Grab Groundwater	09/19/2018 12:15	9814640
MW-507-W-180919 Grab Groundwater	09/19/2018 12:30	9814641
MW-509-W-180919 Grab Groundwater	09/19/2018 10:45	9814642
MW-515-W-180919 Grab Groundwater	09/19/2018 09:45	9814643
MW-516-W-180919 Grab Groundwater	09/19/2018 08:35	9814644
MW-517-W-180919 Grab Groundwater	09/19/2018 08:30	9814645
MW-518-W-180919 Grab Groundwater	09/19/2018 09:25	9814646
DUP-3-WD-180919 Grab Groundwater	09/19/2018	9814647
QA-T-180919 NA Water	09/19/2018	9814648

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

**Sample Description:** MW-139R-W-180919 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9814639  
**ELLE Group #:** 1989869  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 09/21/2018 10:30  
**Collection Date/Time:** 09/19/2018 10:50

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270D SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14244	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14244	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14244	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14244	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14244	Chrysene	218-01-9	N.D.	0.01	1
14244	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1

The recovery for a target analyte(s) in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary. Since the recovery is high and the target analyte(s) was not detected in the sample, the data is reported.

<b>GC Volatiles</b>		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	19	1

<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1

<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	47	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	110	1

The reverse surrogate, capric acid, is present at <1%.

## Sample Comments

State of Washington Lab Certification No. C457

## Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	18268WAB026	09/26/2018 09:23	Catherine E Bachman	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18268WAB026	09/25/2018 17:40	Mathias Okpo	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18268A94A	09/26/2018 19:25	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18268A94A	09/26/2018 19:25	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18268A94A	09/26/2018 19:25	Jeremy C Giffin	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	182690009A	10/02/2018 02:20	Amy Lehr	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	182690009A	09/26/2018 19:30	Oswaldo R Sanchez	1

**Sample Description:** MW-506-W-180919 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9814640  
**ELLE Group #:** 1989869  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 09/21/2018 10:30  
**Collection Date/Time:** 09/19/2018 12:15

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270D SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14244	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14244	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14244	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14244	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14244	Chrysene	218-01-9	N.D.	0.01	1
14244	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1

The recovery for a target analyte(s) in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary. Since the recovery is high and the target analyte(s) was not detected in the sample, the data is reported.

<b>GC Volatiles</b>		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	19	1

<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1

<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	46	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1

The reverse surrogate, capric acid, is present at <1%.

## Sample Comments

State of Washington Lab Certification No. C457

## Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	18268WAB026	09/26/2018 09:52	Catherine E Bachman	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18268WAB026	09/25/2018 17:40	Mathias Okpo	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18268A94A	09/26/2018 19:51	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18268A94A	09/26/2018 19:51	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18268A94A	09/26/2018 19:51	Jeremy C Giffin	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	182690009A	10/02/2018 02:43	Amy Lehr	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	182690009A	09/26/2018 19:30	Oswaldo R Sanchez	1

**Sample Description:** MW-507-W-180919 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9814641  
**ELLE Group #:** 1989869  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 09/21/2018 10:30  
**Collection Date/Time:** 09/19/2018 12:30

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270D SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14244	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14244	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14244	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14244	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14244	Chrysene	218-01-9	N.D.	0.01	1
14244	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1

The recovery for a target analyte(s) in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary. Since the recovery is high and the target analyte(s) was not detected in the sample, the data is reported.

<b>GC Volatiles</b>		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	19	1

<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1

<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	48	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	110	1

The reverse surrogate, capric acid, is present at <1%.

## Sample Comments

State of Washington Lab Certification No. C457

## Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	18268WAB026	09/26/2018 10:21	Catherine E Bachman	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18268WAB026	09/25/2018 17:40	Mathias Okpo	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18268A94A	09/26/2018 20:16	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18268A94A	09/26/2018 20:16	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18268A94A	09/26/2018 20:16	Jeremy C Giffin	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	182690009A	10/02/2018 03:07	Amy Lehr	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	182690009A	09/26/2018 19:30	Oswaldo R Sanchez	1

**Sample Description:** MW-509-W-180919 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9814642  
**ELLE Group #:** 1989869  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 09/21/2018 10:30

**Collection Date/Time:** 09/19/2018 10:45

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270D SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14244	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14244	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14244	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14244	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14244	Chrysene	218-01-9	N.D.	0.01	1
14244	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1

The recovery for a target analyte(s) in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary. Since the recovery is high and the target analyte(s) was not detected in the sample, the data is reported.

<b>GC Volatiles</b>		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	19	1

<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1

<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	82	47	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	110	1

The reverse surrogate, capric acid, is present at <1%.

## Sample Comments

State of Washington Lab Certification No. C457

## Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	18268WAB026	09/26/2018 10:49	Catherine E Bachman	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18268WAB026	09/25/2018 17:40	Mathias Okpo	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18268A94A	09/26/2018 20:42	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18268A94A	09/26/2018 20:42	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18268A94A	09/26/2018 20:42	Jeremy C Giffin	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	182690009A	10/02/2018 03:30	Amy Lehr	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	182690009A	09/26/2018 19:30	Oswaldo R Sanchez	1

**Sample Description:** MW-515-W-180919 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9814643  
**ELLE Group #:** 1989869  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 09/21/2018 10:30

**Collection Date/Time:** 09/19/2018 09:45

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270D SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14244	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14244	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14244	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14244	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14244	Chrysene	218-01-9	N.D.	0.01	1
14244	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1

The recovery for a target analyte(s) in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary. Since the recovery is high and the target analyte(s) was not detected in the sample, the data is reported.

<b>GC Volatiles</b>		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	19	1

<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1

<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	120	48	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	110	1

The reverse surrogate, capric acid, is present at <1%.

## Sample Comments

State of Washington Lab Certification No. C457

## Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	18268WAB026	09/26/2018 11:18	Catherine E Bachman	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18268WAB026	09/25/2018 17:40	Mathias Okpo	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18268A94A	09/26/2018 21:07	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18268A94A	09/26/2018 21:07	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18268A94A	09/26/2018 21:07	Jeremy C Giffin	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	182690009A	10/02/2018 03:54	Amy Lehr	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	182690009A	09/26/2018 19:30	Oswaldo R Sanchez	1

**Sample Description:** MW-516-W-180919 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9814644  
**ELLE Group #:** 1989869  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 09/21/2018 10:30  
**Collection Date/Time:** 09/19/2018 08:35

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270D SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14244	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14244	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14244	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14244	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14244	Chrysene	218-01-9	N.D.	0.01	1
14244	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1

The recovery for a target analyte(s) in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary. Since the recovery is high and the target analyte(s) was not detected in the sample, the data is reported.

<b>GC Volatiles</b>		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	19	1

<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1

<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	48	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	110	1

The reverse surrogate, capric acid, is present at <1%.

## Sample Comments

State of Washington Lab Certification No. C457

## Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	18268WAB026	09/26/2018 11:47	Catherine E Bachman	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18268WAB026	09/25/2018 17:40	Mathias Okpo	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18268A94A	09/26/2018 21:33	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18268A94A	09/26/2018 21:33	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18268A94A	09/26/2018 21:33	Jeremy C Giffin	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	182690009A	10/02/2018 04:17	Amy Lehr	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	182690009A	09/26/2018 19:30	Oswaldo R Sanchez	1



**Sample Description:** MW-517-W-180919 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9814645  
**ELLE Group #:** 1989869  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 09/21/2018 10:30

**Collection Date/Time:** 09/19/2018 08:30

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270D SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14244	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14244	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14244	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14244	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14244	Chrysene	218-01-9	N.D.	0.01	1
14244	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1

The recovery for a target analyte(s) in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary. Since the recovery is high and the target analyte(s) was not detected in the sample, the data is reported.

<b>GC Volatiles</b>		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	19	1

<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1

<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	47	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1

The reverse surrogate, capric acid, is present at <1%.

## Sample Comments

State of Washington Lab Certification No. C457

## Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	18268WAB026	09/26/2018 12:16	Catherine E Bachman	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18268WAB026	09/25/2018 17:40	Mathias Okpo	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18268A94A	09/26/2018 21:59	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18268A94A	09/26/2018 21:59	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18268A94A	09/26/2018 21:59	Jeremy C Giffin	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	182740022A	10/04/2018 01:27	Amy Lehr	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	182740022A	10/01/2018 20:00	Oswaldo R Sanchez	1

**Sample Description:** MW-518-W-180919 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9814646  
**ELLE Group #:** 1989869  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 09/21/2018 10:30  
**Collection Date/Time:** 09/19/2018 09:25

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270D SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14244	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14244	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14244	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14244	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14244	Chrysene	218-01-9	N.D.	0.01	1
14244	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1

The recovery for a target analyte(s) in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary. Since the recovery is high and the target analyte(s) was not detected in the sample, the data is reported.

<b>GC Volatiles</b>		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	370	19	1

<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1

<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	47	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1

The reverse surrogate, capric acid, is present at <1%.

## Sample Comments

State of Washington Lab Certification No. C457

## Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	18268WAB026	09/26/2018 12:45	Catherine E Bachman	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18268WAB026	09/25/2018 17:40	Mathias Okpo	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18268A94A	09/26/2018 22:24	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18268A94A	09/26/2018 22:24	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18268A94A	09/26/2018 22:24	Jeremy C Giffin	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	182740022A	10/04/2018 01:51	Amy Lehr	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	182740022A	10/01/2018 20:00	Oswaldo R Sanchez	1

**Sample Description:** DUP-3-WD-180919 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9814647  
**ELLE Group #:** 1989869  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 09/21/2018 10:30  
**Collection Date/Time:** 09/19/2018

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270D SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14244	Benzo(a)anthracene	56-55-3	0.01	0.01	1
14244	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14244	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14244	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14244	Chrysene	218-01-9	N.D.	0.01	1
14244	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1

The recovery for a target analyte(s) in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary. Sufficient sample was not available to repeat the analysis.

<b>GC Volatiles</b>		<b>ECY 97-602 NWT PH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWT PH-Gx water C7-C12	n.a.	N.D.	19	1

<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1

<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWT PH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	49	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	110	1

The reverse surrogate, capric acid, is present at <1%.

## Sample Comments

State of Washington Lab Certification No. C457

## Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	18268WAB026	09/26/2018 13:14	Catherine E Bachman	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18268WAB026	09/25/2018 17:40	Mathias Okpo	1
08274	NWT PH-Gx water C7-C12	ECY 97-602 NWT PH-Gx	1	18268A94A	09/26/2018 23:41	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18268A94A	09/26/2018 23:41	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18268A94A	09/26/2018 23:41	Jeremy C Giffin	1
12917	NWT PH-Dx water w/Si Gel	ECY 97-602 NWT PH-Dx modified	1	182740022A	10/04/2018 03:01	Amy Lehr	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWT PH-Dx 06/97	1	182740022A	10/01/2018 20:00	Oswaldo R Sanchez	1

**Sample Description:** QA-T-180919 NA Water  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9814648  
**ELLE Group #:** 1989869  
**Matrix:** Water

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 09/21/2018 10:30  
**Collection Date/Time:** 09/19/2018

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC Volatiles</b>					
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx n.a.	ug/l N.D.	ug/l 19	1
<b>GC Volatiles</b>					
02102	Benzene	SW-846 8021B 71-43-2	ug/l N.D.	ug/l 0.5	1

### Sample Comments

State of Washington Lab Certification No. C457

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18268A94A	09/26/2018 18:34	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18268A94A	09/26/2018 18:34	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18268A94A	09/26/2018 18:34	Jeremy C Giffin	1

## Quality Control Summary

Client Name: Chevron Environmental Mgmt Co  
Reported: 10/09/2018 15:20

Group Number: 1989869

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

### Method Blank

Analysis Name	Result ug/l	MDL ug/l
Batch number: 18268WAB026	Sample number(s): 9814639-9814647	
Benzo(a)anthracene	N.D.	0.01
Benzo(a)pyrene	N.D.	0.01
Benzo(b)fluoranthene	N.D.	0.01
Benzo(k)fluoranthene	N.D.	0.01
Chrysene	N.D.	0.01
Dibenz(a,h)anthracene	N.D.	0.02
Indeno(1,2,3-cd)pyrene	N.D.	0.01
Batch number: 18268A94A	Sample number(s): 9814639-9814648	
Benzene	N.D.	0.03
NWTPH-Gx water C7-C12	N.D.	19
Batch number: 182690009A	Sample number(s): 9814639-9814644	
DX DRO C12-C24 w/ SiGel	N.D.	45
DX HRO C24-C40 w/ SiGel	N.D.	100
Batch number: 182740022A	Sample number(s): 9814645-9814647	
DX DRO C12-C24 w/ SiGel	N.D.	45
DX HRO C24-C40 w/ SiGel	N.D.	100

### LCS/LCSD

Analysis Name	LCS Spike Added ug/l	LCS Conc ug/l	LCSD Spike Added ug/l	LCSD Conc ug/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: 18268WAB026	Sample number(s): 9814639-9814647								
Benzo(a)anthracene	1.00	1.14			114*		67-111		
Benzo(a)pyrene	1.00	1.10			110		69-121		
Benzo(b)fluoranthene	1.00	1.17			117		70-123		
Benzo(k)fluoranthene	1.00	1.06			106		66-120		
Chrysene	1.00	0.984			98		66-109		
Dibenz(a,h)anthracene	1.00	1.10			110		55-123		
Indeno(1,2,3-cd)pyrene	1.00	1.15			115		52-124		
	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>					
Batch number: 18268A94A	Sample number(s): 9814639-9814648								
Benzene	20	20.65			103		80-120		

\*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

## Quality Control Summary

Client Name: Chevron Environmental Mgmt Co  
Reported: 10/09/2018 15:20

Group Number: 1989869

### LCS/LCSD (continued)

Analysis Name	LCS Spike Added ug/l	LCS Conc ug/l	LCSD Spike Added ug/l	LCSD Conc ug/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
NWTPH-Gx water C7-C12	1100	1419.56			129		64-131		
	ug/l	ug/l	ug/l	ug/l					
Batch number: 182690009A DX DRO C12-C24 w/ SiGel	Sample number(s): 9814639-9814644								
	602.24	174.36	602.24	228.95	29	38	10-115	27*	20
Batch number: 182740022A DX DRO C12-C24 w/ SiGel	Sample number(s): 9814645-9814647								
	602.24	226.09			38		10-115		

### Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: SIM SVOAs 8270D MINI  
Batch number: 18268WAB026

	Fluoranthene-d10	Benzo(a)pyrene-d12	1-Methylnaphthalene-d10
9814639	96	61	72
9814640	80	80	72
9814641	80	27	73
9814642	103	27	78
9814643	100	64	74
9814644	96	44	81
9814645	98	52	77
9814646	85	68	73
9814647	73	77	67
Blank	116	113	84
LCS	84	101	82
Limits:	38-119	18-129	29-112

Analysis Name: Method 8021 Water Master  
Batch number: 18268A94A

	Trifluorotoluene-P	Trifluorotoluene-F
9814639	86	79
9814640	87	93
9814641	87	80
9814642	89	81
9814643	87	81
9814644	89	79
9814645	87	80
9814646	85	84

\*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

## Quality Control Summary

Client Name: Chevron Environmental Mgmt Co  
Reported: 10/09/2018 15:20

Group Number: 1989869

### Surrogate Quality Control (continued)

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: Method 8021 Water Master  
Batch number: 18268A94A

	Trifluorotoluene-P	Trifluorotoluene-F
9814647	87	81
9814648	87	82
Blank	88	83
LCS	88	101
Limits:	51-120	50-150

Analysis Name: NWTPH-Dx water w/Si Gel  
Batch number: 182690009A

	Orthoterphenyl
9814639	69
9814640	68
9814641	66
9814642	69
9814643	68
9814644	68
Blank	67
LCS	50
LCSD	65
Limits:	50-150

Analysis Name: NWTPH-Dx water w/Si Gel  
Batch number: 182740022A

	Orthoterphenyl
9814645	59
9814646	60
9814647	73
Blank	67
LCS	75
Limits:	50-150

\*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

# Chevron Northwest Region Analysis Request/Chain of Custody



**Lancaster Laboratories**

Acct. # 11964

For Lancaster Laboratories use only  
 Group # 1989869 Sample # 9814639-48

Instructions on reverse side correspond with circled numbers.

① Client Information			④ Matrix			⑤ Analyses Requested										⑥ Remarks											
Facility # <u>Edmonds Terminal</u> WBS <u>NWENLPM6001430802</u>			<input type="checkbox"/> Sediment <input checked="" type="checkbox"/> Potable <input checked="" type="checkbox"/> Ground <input type="checkbox"/> Surface <input type="checkbox"/> NPDES <input type="checkbox"/> Air	<input type="checkbox"/> Soil <input type="checkbox"/> Water <input type="checkbox"/> Oil	Total Number of Containers BTEX+MTBE <input checked="" type="checkbox"/> 8021/8260 <input type="checkbox"/> Naphth 8260 full scan Oxygenates NWTPH GX NWTPH DX <input checked="" type="checkbox"/> Silica Gel Cleanup Lead <input type="checkbox"/> Total <input type="checkbox"/> Diss. <input type="checkbox"/> Method WAVPH <input type="checkbox"/> WAEPH	SCR #: _____ <input type="checkbox"/> Results in Dry Weight <input type="checkbox"/> J value reporting needed <input type="checkbox"/> Must meet lowest detection limits possible for 8260 compounds <input type="checkbox"/> 8021 MTBE Confirmation <input type="checkbox"/> Confirm MTBE + Naphthalene <input type="checkbox"/> Confirm highest hit by 8260 <input type="checkbox"/> Confirm all hits by 8260 <input type="checkbox"/> Run _____ oxy's on highest hit <input type="checkbox"/> Run _____ oxy's on all hits CPAHS by USEPA 8270 SIM										⑥ Remarks * use standard Silica gel cleanup											
Site Address <u>11720 unoco Rd, Edmonds, WA</u>																											
Chevron PM <u>Kim Jolitz</u> Lead Consultant <u>Arccadis</u>																											
Consultant/Office <u>1100 olive way, suite 800, Seattle, WA</u>																											
Consultant Project Mgr. <u>Scott Zorn</u>			Consultant Phone # _____																								
Sampler <u>Eric Krueger and Jason Little</u>			③ Grab Composite																								
② Sample Identification		Collected																									
		Date	Time	Grab	Composite	Soil	Water	Oil	Total Number of Containers	BTEX+MTBE	8021/8260	Naphth	8260 full scan	Oxygenates	NWTPH GX	NWTPH DX	Silica Gel Cleanup	Lead	Total	Diss.	Method	WAVPH	WAEPH				
<u>MW-139R</u>		<u>9/19/18</u>	<u>1050</u>						<u>10</u>	<input checked="" type="checkbox"/>															* use standard Silica gel cleanup		
<u>MW-506</u>			<u>1215</u>						<u>10</u>	<input checked="" type="checkbox"/>																	
<u>MW-507</u>			<u>1230</u>						<u>10</u>	<input checked="" type="checkbox"/>																	
<u>MW-509</u>			<u>1045</u>						<u>10</u>	<input checked="" type="checkbox"/>																	
<u>MW-515</u>			<u>0945</u>						<u>10</u>	<input checked="" type="checkbox"/>																	
<u>MW-516</u>			<u>0835</u>						<u>10</u>	<input checked="" type="checkbox"/>																	
<u>MW-517</u>			<u>0830</u>						<u>10</u>	<input checked="" type="checkbox"/>																	
<u>MW-518</u>			<u>0925</u>						<u>10</u>	<input checked="" type="checkbox"/>																	
<u>DUP-3</u>			<u>---</u>						<u>10</u>	<input checked="" type="checkbox"/>																	
<u>Trip Blank</u>			<u>---</u>						<u>2</u>	<input checked="" type="checkbox"/>																	
⑦ Turnaround Time Requested (TAT) (please circle)				Relinquished by				Date		Time		Received by				Date		Time									
<input checked="" type="radio"/> Standard    5 day    4 day <input type="radio"/> 72 hour    48 hour    24 hour				<u>[Signature]</u>				<u>9/19/18</u>		<u>1540</u>		<u>[Signature]</u>															
⑧ Data Package Options (please circle if required)				Relinquished by Commerical Carrier:				Received by				Date		Time													
<input checked="" type="radio"/> Type I - Full    Type VI (Raw Data)				UPS _____ FedEx <u>✓</u> Other _____				<u>[Signature]</u>				<u>9/21/18</u>		<u>1030</u>													
				Temperature Upon Receipt <u>3.2/2.2 °C</u>				Custody Seals Intact?				<input checked="" type="radio"/> Yes		<input type="radio"/> No													





Client: Chevron c/o Arcadis

**Delivery and Receipt Information**

Delivery Method:	<u>Fed Ex</u>	Arrival Timestamp:	<u>09/21/2018 10:30</u>
Number of Packages:	<u>2</u>	Number of Projects:	<u>1</u>

**Arrival Condition Summary**

Shipping Container Sealed:	Yes	Sample IDs on COC match Containers:	Yes
Custody Seal Present:	Yes	Sample Date/Times match COC:	Yes
Custody Seal Intact:	Yes	VOA Vial Headspace $\geq$ 6mm:	No
Samples Chilled:	Yes	Total Trip Blank Qty:	2
Paperwork Enclosed:	Yes	Trip Blank Type:	HCI
Samples Intact:	Yes	Air Quality Samples Present:	No
Missing Samples:	No		
Extra Samples:	No		
Discrepancy in Container Qty on COC:	No		

*Unpacked by Nicole Reiff (25684) at 13:15 on 09/21/2018*

**Samples Chilled Details**

Thermometer Types: DT = Digital (Temp. Bottle) IR = Infrared (Surface Temp) All Temperatures in °C.

Cooler #	Thermometer ID	Corrected Temp	Therm. Type	Ice Type	Ice Present?	Ice Container	Elevated Temp?
1	DT146	3.2	DT	Wet	Y	Bagged	N
2	DT146	2.2	DT	Wet	Y	Bagged	N

# Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

<b>BMQL</b>	Below Minimum Quantitation Level	<b>mL</b>	milliliter(s)
<b>C</b>	degrees Celsius	<b>MPN</b>	Most Probable Number
<b>cfu</b>	colony forming units	<b>N.D.</b>	non-detect
<b>CP Units</b>	cobalt-chloroplatinate units	<b>ng</b>	nanogram(s)
<b>F</b>	degrees Fahrenheit	<b>NTU</b>	nephelometric turbidity units
<b>g</b>	gram(s)	<b>pg/L</b>	picogram/liter
<b>IU</b>	International Units	<b>RL</b>	Reporting Limit
<b>kg</b>	kilogram(s)	<b>TNTC</b>	Too Numerous To Count
<b>L</b>	liter(s)	<b>µg</b>	microgram(s)
<b>lb.</b>	pound(s)	<b>µL</b>	microliter(s)
<b>m3</b>	cubic meter(s)	<b>umhos/cm</b>	micromhos/cm
<b>meq</b>	milliequivalents	<b>MCL</b>	Maximum Contamination Limit
<b>mg</b>	milligram(s)		
<b>&lt;</b>	less than		
<b>&gt;</b>	greater than		
<b>ppm</b>	parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.		
<b>ppb</b>	parts per billion		
<b>Dry weight basis</b>	Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.		

**Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.**

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

This report shall not be reproduced except in full, without the written approval of the laboratory.

Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as “analyze immediately” are not performed within 15 minutes.

**WARRANTY AND LIMITS OF LIABILITY** - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. THE FOREGOING EXPRESS WARRANTY IS EXCLUSIVE AND IS GIVEN IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. WE DISCLAIM ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING A WARRANTY OF FITNESS FOR PARTICULAR PURPOSE AND WARRANTY OF MERCHANTABILITY. IN NO EVENT SHALL EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL, LLC BE LIABLE FOR INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR LOSS OF PROFIT OR GOODWILL REGARDLESS OF (A) THE NEGLIGENCE (EITHER SOLE OR CONCURRENT) OF EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL AND (B) WHETHER EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL HAS BEEN INFORMED OF THE POSSIBILITY OF SUCH DAMAGES. We accept no legal responsibility for the purposes for which the client uses the test results. No purchase order or other order for work shall be accepted by Eurofins Lancaster Laboratories Environmental which includes any conditions that vary from the Standard Terms and Conditions, and Eurofins Lancaster Laboratories Environmental hereby objects to any conflicting terms contained in any acceptance or order submitted by client.

# Data Qualifiers

Qualifier	Definition
C	Result confirmed by reanalysis
D1	Indicates for dual column analyses that the result is reported from column 1
D2	Indicates for dual column analyses that the result is reported from column 2
E	Concentration exceeds the calibration range
K1	Initial Calibration Blank is above the QC limit and the sample result is ND
K2	Continuing Calibration Blank is above the QC limit and the sample result is ND
K3	Initial Calibration Verification is above the QC limit and the sample result is ND
K4	Continuing Calibration Verification is above the QC limit and the sample result is ND
J (or G, I, X)	Estimated value $\geq$ the Method Detection Limit (MDL or DL) and $<$ the Limit of Quantitation (LOQ or RL)
P	Concentration difference between the primary and confirmation column $>40\%$ . The lower result is reported.
P^	Concentration difference between the primary and confirmation column $> 40\%$ . The higher result is reported.
U	Analyte was not detected at the value indicated
V	Concentration difference between the primary and confirmation column $>100\%$ . The reporting limit is raised due to this disparity and evident interference.
W	The dissolved oxygen uptake for the unseeded blank is greater than 0.20 mg/L.
Z	Laboratory Defined - see analysis report

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods. Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.



## ANALYSIS REPORT

Prepared by:

Eurofins Lancaster Laboratories Environmental  
2425 New Holland Pike  
Lancaster, PA 17601

Prepared for:

Chevron Environmental Mgmt Co  
BR1 X5139C  
6101 Bollinger Canyon Road  
San Ramon CA 94583

Report Date: October 23, 2018 11:00

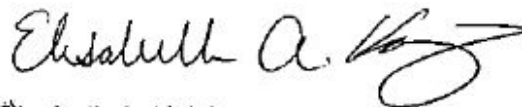
### Project: Edmonds Terminal

Account #: 11964  
Group Number: 1990016  
PO Number: 0015268291  
Release Number: JOLITZ  
State of Sample Origin: WA

Electronic Copy To Arcadis  
Electronic Copy To ARCADIS U.S., Inc.  
Electronic Copy To Arcadis  
Electronic Copy To Arcadis  
Electronic Copy To Arcadis  
Electronic Copy To Arcadis

Attn: Scott Zorn  
Attn: Sam Miles  
Attn: Jason Little  
Attn: Ryan Brauchla  
Attn: Ophelie Encelle  
Attn: Eric Krueger

Respectfully Submitted,



Elisabeth A. Knisley  
Project Manager

(717) 556-7262

To view our laboratory's current scopes of accreditation please go to <http://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster-laboratories-environmental/resources/certifications/>. Historical copies may be requested through your project manager.



## SAMPLE INFORMATION

<u>Client Sample Description</u>	<u>Sample Collection Date/Time</u>	<u>ELLE#</u>
LM-2-W-180920 Grab Groundwater	09/20/2018 08:45	9815394
MW-502-W-180920 Grab Groundwater	09/20/2018 11:45	9815395
MW-503-W-180920 Grab Groundwater	09/20/2018 10:30	9815396
MW-504-W-180920 Grab Groundwater	09/20/2018 09:50	9815397
MW-504-W-180920 MS Grab Groundwater	09/20/2018 09:50	9815398
MW-504-W-180920 MSD Grab Groundwater	09/20/2018 09:50	9815399
MW-505-W-180920 Grab Groundwater	09/20/2018 09:55	9815400
MW-511-W-180920 Grab Groundwater	09/20/2018 09:00	9815401
MW-512-W-180920 Grab Groundwater	09/20/2018 12:15	9815402
MW-513-W-180920 Grab Groundwater	09/20/2018 11:30	9815403
MW-514-W-180920 Grab Groundwater	09/20/2018 11:10	9815404
MW-530-W-180920 Grab Groundwater	09/20/2018 08:35	9815405
DUP-4-WD-180920 Grab Groundwater	09/20/2018	9815406
QA-T-180920 NA Water	09/20/2018	9815407

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

**Sample Description:** LM-2-W-180920 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9815394  
**ELLE Group #:** 1990016  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 09/21/2018 10:30  
**Collection Date/Time:** 09/20/2018 08:45

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270D SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14244	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14244	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14244	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14244	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14244	Chrysene	218-01-9	N.D.	0.01	1
14244	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1

The recovery for a target analyte(s) in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary. Since the recovery is high and the target analyte(s) was not detected in the sample, the data is reported.

<b>GC Volatiles</b>		<b>ECY 97-602 NWT PH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWT PH-Gx water C7-C12	n.a.	N.D.	19	1

<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1

<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWT PH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	54	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	120	1

The reverse surrogate, capric acid, is present at <1%.

The recovery for the sample surrogate(s) is outside the QC acceptance limits as noted on the QC Summary. The following action was taken: The sample was re-extracted outside of method holding time. The second trial's data confirmed the original trial's data, which is reported here.

### Sample Comments

State of Washington Lab Certification No. C457  
Carcinogenic PAHs have been reported for this sample

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	18268WAB026	09/26/2018 13:42	Catherine E Bachman	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18268WAB026	09/25/2018 17:40	Mathias Okpo	1
08274	NWT PH-Gx water C7-C12	ECY 97-602 NWT PH-Gx	1	18268A94A	09/27/2018 00:06	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18268A94A	09/27/2018 00:06	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18268A94A	09/27/2018 00:06	Jeremy C Giffin	1
12917	NWT PH-Dx water w/Si Gel	ECY 97-602 NWT PH-Dx modified	1	182740022A	10/04/2018 03:24	Thomas C Wildermuth	1

**Sample Description:** LM-2-W-180920 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

Chevron Environmental Mgmt Co  
ELLE Sample #: WW 9815394  
ELLE Group #: 1990016  
Matrix: Groundwater

**Project Name:** Edmonds Terminal

Submittal Date/Time: 09/21/2018 10:30  
Collection Date/Time: 09/20/2018 08:45

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPh-Dx 06/97	1	182740022A	10/01/2018 20:00	Oswaldo R Sanchez	1

**Sample Description:** MW-502-W-180920 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9815395  
**ELLE Group #:** 1990016  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 09/21/2018 10:30

**Collection Date/Time:** 09/20/2018 11:45

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270D SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14244	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14244	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14244	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14244	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14244	Chrysene	218-01-9	N.D.	0.01	1
14244	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1

The recovery for a target analyte(s) in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary. Since the recovery is high and the target analyte(s) was not detected in the sample, the data is reported.

<b>GC Volatiles</b>		<b>ECY 97-602 NWTTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTTPH-Gx water C7-C12	n.a.	N.D.	19	1

<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1

<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWTTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	47	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	110	1

The reverse surrogate, capric acid, is present at <1%.

### Sample Comments

State of Washington Lab Certification No. C457  
Carcinogenic PAHs have been reported for this sample

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	18268WAB026	09/26/2018 14:11	Catherine E Bachman	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18268WAB026	09/25/2018 17:40	Mathias Okpo	1
08274	NWTTPH-Gx water C7-C12	ECY 97-602 NWTTPH-Gx	1	18268A94A	09/27/2018 00:32	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18268A94A	09/27/2018 00:32	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18268A94A	09/27/2018 00:32	Jeremy C Giffin	1
12917	NWTTPH-Dx water w/Si Gel	ECY 97-602 NWTTPH-Dx modified	1	182740022A	10/04/2018 03:48	Amy Lehr	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTTPH-Dx 06/97	1	182740022A	10/01/2018 20:00	Osvaldo R Sanchez	1



**Sample Description:** MW-503-W-180920 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9815396  
**ELLE Group #:** 1990016  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 09/21/2018 10:30  
**Collection Date/Time:** 09/20/2018 10:30

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270D SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14244	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14244	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14244	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14244	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14244	Chrysene	218-01-9	N.D.	0.01	1
14244	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1

The recovery for a target analyte(s) in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary. Since the recovery is high and the target analyte(s) was not detected in the sample, the data is reported.

<b>GC Volatiles</b>		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	19	1

<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1

<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	47	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1

The reverse surrogate, capric acid, is present at <1%.

### Sample Comments

State of Washington Lab Certification No. C457  
Carcinogenic PAHs have been reported for this sample

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	18269WAE026	09/29/2018 18:05	Kira N Beck	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18269WAE026	09/26/2018 16:40	Oswaldo R Sanchez	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18268A94A	09/27/2018 00:57	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18268A94A	09/27/2018 00:57	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18268A94A	09/27/2018 00:57	Jeremy C Giffin	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	182740022A	10/04/2018 04:11	Amy Lehr	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	182740022A	10/01/2018 20:00	Oswaldo R Sanchez	1

**Sample Description:** MW-504-W-180920 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9815397  
**ELLE Group #:** 1990016  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 09/21/2018 10:30  
**Collection Date/Time:** 09/20/2018 09:50

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270D SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14244	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14244	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14244	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14244	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14244	Chrysene	218-01-9	N.D.	0.01	1
14244	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1

The recovery for a target analyte(s) in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary. Since the recovery is high and the target analyte(s) was not detected in the sample, the data is reported.

<b>GC Volatiles</b>		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	19	1

<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1

<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	51	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	110	1

The reverse surrogate, capric acid, is present at <1%.

### Sample Comments

State of Washington Lab Certification No. C457  
Carcinogenic PAHs have been reported for this sample

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	18269WAE026	09/29/2018 18:33	Kira N Beck	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18269WAE026	09/26/2018 16:40	Oswaldo R Sanchez	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18268A94A	09/27/2018 01:23	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18268A94A	09/27/2018 01:23	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18268A94A	09/27/2018 01:23	Jeremy C Giffin	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	182740022A	10/04/2018 00:17	Amy Lehr	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	182740022A	10/01/2018 20:00	Oswaldo R Sanchez	1

**Sample Description:** MW-504-W-180920 MS Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9815398  
**ELLE Group #:** 1990016  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 09/21/2018 10:30  
**Collection Date/Time:** 09/20/2018 09:50

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270D SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14244	Benzo(a)anthracene	56-55-3	1	0.01	1
14244	Benzo(a)pyrene	50-32-8	1	0.01	1
14244	Benzo(b)fluoranthene	205-99-2	1	0.01	1
14244	Benzo(k)fluoranthene	207-08-9	1	0.01	1
14244	Chrysene	218-01-9	1	0.01	1
14244	Dibenz(a,h)anthracene	53-70-3	0.8	0.02	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	0.9	0.01	1
<b>GC Volatiles</b>		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	1,500	19	1
<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	22	0.5	1
<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	180	48	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	110	1
The reverse surrogate, capric acid, is present at <1%.					

### Sample Comments

State of Washington Lab Certification No. C457  
Carcinogenic PAHs have been reported for this sample

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	18269WAE026	09/29/2018 19:02	Kira N Beck	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18269WAE026	09/26/2018 16:40	Oswaldo R Sanchez	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18268A94A	09/27/2018 02:40	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18268A94A	09/27/2018 01:48	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18268A94A	09/27/2018 01:48	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	2	18268A94A	09/27/2018 02:40	Jeremy C Giffin	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	182740022A	10/04/2018 00:40	Amy Lehr	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	182740022A	10/01/2018 20:00	Oswaldo R Sanchez	1

**Sample Description:** MW-504-W-180920 MSD Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9815399  
**ELLE Group #:** 1990016  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 09/21/2018 10:30  
**Collection Date/Time:** 09/20/2018 09:50

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270D SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14244	Benzo(a)anthracene	56-55-3	1	0.01	1
14244	Benzo(a)pyrene	50-32-8	0.9	0.01	1
14244	Benzo(b)fluoranthene	205-99-2	1	0.01	1
14244	Benzo(k)fluoranthene	207-08-9	1	0.01	1
14244	Chrysene	218-01-9	1	0.01	1
14244	Dibenz(a,h)anthracene	53-70-3	0.7	0.02	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	0.8	0.01	1
<b>GC Volatiles</b>		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	1,500	19	1
<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	22	0.5	1
<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	200	49	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	110	1
The reverse surrogate, capric acid, is present at <1%.					

### Sample Comments

State of Washington Lab Certification No. C457  
Carcinogenic PAHs have been reported for this sample

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	18269WAE026	09/29/2018 19:30	Kira N Beck	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18269WAE026	09/26/2018 16:40	Oswaldo R Sanchez	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18268A94A	09/27/2018 03:05	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18268A94A	09/27/2018 02:14	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18268A94A	09/27/2018 02:14	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	2	18268A94A	09/27/2018 03:05	Jeremy C Giffin	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	182740022A	10/04/2018 01:04	Amy Lehr	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	182740022A	10/01/2018 20:00	Oswaldo R Sanchez	1

**Sample Description:** MW-505-W-180920 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9815400  
**ELLE Group #:** 1990016  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 09/21/2018 10:30  
**Collection Date/Time:** 09/20/2018 09:55

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270D SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14244	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14244	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14244	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14244	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14244	Chrysene	218-01-9	N.D.	0.01	1
14244	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1

The recovery for a target analyte(s) in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary. Since the recovery is high and the target analyte(s) was not detected in the sample, the data is reported.

<b>GC Volatiles</b>		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	19	1

<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1

<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	47	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1

The reverse surrogate, capric acid, is present at <1%.

### Sample Comments

State of Washington Lab Certification No. C457  
Carcinogenic PAHs have been reported for this sample

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	18269WAE026	09/29/2018 19:58	Kira N Beck	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18269WAE026	09/26/2018 16:40	Oswaldo R Sanchez	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18268A94A	09/27/2018 03:31	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18268A94A	09/27/2018 03:31	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18268A94A	09/27/2018 03:31	Jeremy C Giffin	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	182740022A	10/04/2018 04:34	Amy Lehr	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	182740022A	10/01/2018 20:00	Oswaldo R Sanchez	1

**Sample Description:** MW-511-W-180920 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9815401  
**ELLE Group #:** 1990016  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 09/21/2018 10:30  
**Collection Date/Time:** 09/20/2018 09:00

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270D SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14244	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14244	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14244	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14244	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14244	Chrysene	218-01-9	N.D.	0.01	1
14244	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1

The recovery for a target analyte(s) in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary. Since the recovery is high and the target analyte(s) was not detected in the sample, the data is reported.

<b>GC Volatiles</b>		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	19	1

<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1

<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	46	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1

The reverse surrogate, capric acid, is present at <1%.

### Sample Comments

State of Washington Lab Certification No. C457  
Carcinogenic PAHs have been reported for this sample

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	18269WAE026	09/29/2018 20:26	Kira N Beck	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18269WAE026	09/26/2018 16:40	Oswaldo R Sanchez	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18268A94A	09/27/2018 04:47	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18268A94A	09/27/2018 04:47	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18268A94A	09/27/2018 04:47	Jeremy C Giffin	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	182740022A	10/04/2018 04:58	Amy Lehr	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	182740022A	10/01/2018 20:00	Oswaldo R Sanchez	1

**Sample Description:** MW-512-W-180920 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9815402  
**ELLE Group #:** 1990016  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 09/21/2018 10:30  
**Collection Date/Time:** 09/20/2018 12:15

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270D SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14244	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14244	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14244	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14244	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14244	Chrysene	218-01-9	N.D.	0.01	1
14244	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1

The recovery for a target analyte(s) in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary. Since the recovery is high and the target analyte(s) was not detected in the sample, the data is reported.

<b>GC Volatiles</b>		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	19	1

<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1

<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	47	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1

The reverse surrogate, capric acid, is present at <1%.

### Sample Comments

State of Washington Lab Certification No. C457  
Carcinogenic PAHs have been reported for this sample

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	18269WAE026	09/29/2018 20:54	Kira N Beck	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18269WAE026	09/26/2018 16:40	Oswaldo R Sanchez	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18268A94A	09/27/2018 05:13	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18268A94A	09/27/2018 05:13	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18268A94A	09/27/2018 05:13	Jeremy C Giffin	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	182740022A	10/04/2018 05:21	Amy Lehr	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	182740022A	10/01/2018 20:00	Oswaldo R Sanchez	1

**Sample Description:** MW-513-W-180920 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9815403  
**ELLE Group #:** 1990016  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 09/21/2018 10:30

**Collection Date/Time:** 09/20/2018 11:30

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270D SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14244	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14244	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14244	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14244	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14244	Chrysene	218-01-9	N.D.	0.01	1
14244	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1

The recovery for a target analyte(s) in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary. Since the recovery is high and the target analyte(s) was not detected in the sample, the data is reported.

<b>GC Volatiles</b>		<b>ECY 97-602 NWT PH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWT PH-Gx water C7-C12	n.a.	N.D.	19	1

<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1

<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWT PH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	56	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	130	1

**Trial ID: RE**

12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	46	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1

The recovery for a target analyte(s) and surrogate in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary.  
The recovery for the sample surrogate(s) is outside the QC acceptance limits as noted on the QC Summary.  
The recovery for the method blank surrogate(s) is outside the QC acceptance limits as noted on the QC Summary.  
The following action was taken:  
The sample was re-extracted outside the method required holding time and the QC is compliant. Results are reported from both trials.

### Sample Comments

State of Washington Lab Certification No. C457  
Carcinogenic PAHs have been reported for this sample

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	18269WAE026	09/29/2018 21:22	Kira N Beck	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18269WAE026	09/26/2018 16:40	Oswaldo R Sanchez	1



**Sample Description:** MW-513-W-180920 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9815403  
**ELLE Group #:** 1990016  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submittal Date/Time:** 09/21/2018 10:30

**Collection Date/Time:** 09/20/2018 11:30

## Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18268A94A	09/27/2018 05:38	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18268A94A	09/27/2018 05:38	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18268A94A	09/27/2018 05:38	Jeremy C Giffin	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	182750019A	10/05/2018 21:37	Marisa Englebright	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	2-RE	182820002A	10/18/2018 05:26	Marisa Englebright	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	182750019A	10/01/2018 21:00	Mathias Okpo	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	2	182820002A	10/09/2018 22:00	Mathias Okpo	1

**Sample Description:** MW-514-W-180920 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9815404  
**ELLE Group #:** 1990016  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 09/21/2018 10:30  
**Collection Date/Time:** 09/20/2018 11:10

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270D SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14244	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14244	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14244	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14244	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14244	Chrysene	218-01-9	N.D.	0.01	1
14244	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1

The recovery for a target analyte(s) in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary. Since the recovery is high and the target analyte(s) was not detected in the sample, the data is reported.

<b>GC Volatiles</b>		<b>ECY 97-602 NWT PH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWT PH-Gx water C7-C12	n.a.	N.D.	19	1

<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1

<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWT PH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	46	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1

**Trial ID: RE**

12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	45	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1

The recovery for a target analyte(s) and surrogate in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary.  
The recovery for the sample surrogate(s) is outside the QC acceptance limits as noted on the QC Summary.  
The recovery for the method blank surrogate(s) is outside the QC acceptance limits as noted on the QC Summary.  
The following action was taken:  
The sample was re-extracted outside the method required holding time and the QC is compliant. Results are reported from both trials.

### Sample Comments

State of Washington Lab Certification No. C457  
Carcinogenic PAHs have been reported for this sample

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	18269WAE026	09/29/2018 21:50	Kira N Beck	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18269WAE026	09/26/2018 16:40	Oswaldo R Sanchez	1

**Sample Description:** MW-514-W-180920 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9815404  
**ELLE Group #:** 1990016  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submittal Date/Time:** 09/21/2018 10:30

**Collection Date/Time:** 09/20/2018 11:10

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18269B94A	10/01/2018 18:03	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18269B94A	10/01/2018 18:03	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18269B94A	10/01/2018 18:03	Jeremy C Giffin	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	182750019A	10/05/2018 22:00	Marisa Englebright	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	2-RE	182820002A	10/18/2018 05:49	Marisa Englebright	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	182750019A	10/01/2018 21:00	Mathias Okpo	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	2	182820002A	10/09/2018 22:00	Mathias Okpo	1

**Sample Description:** MW-530-W-180920 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9815405  
**ELLE Group #:** 1990016  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submittal Date/Time:** 09/21/2018 10:30  
**Collection Date/Time:** 09/20/2018 08:35

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270D SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14244	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14244	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14244	Benzo(b)fluoranthene	205-99-2	0.01	0.01	1
14244	Benzo(k)fluoranthene	207-08-9	0.01	0.01	1
14244	Chrysene	218-01-9	0.02	0.01	1
14244	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1

The recovery for a target analyte(s) in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary. The following action was taken:

The sample was re-extracted outside the method required holding time and the QC is compliant. All results are reported from the first trial.

<b>GC Volatiles</b>		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	19	1

<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1

<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	49	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	110	1

**Trial ID: RE**

12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	50	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	110	1

The recovery for a target analyte(s) and surrogate in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary.

The recovery for the sample surrogate(s) is outside the QC acceptance limits as noted on the QC Summary.

The recovery for the method blank surrogate(s) is outside the QC acceptance limits as noted on the QC Summary.

The following action was taken:

The sample was re-extracted outside the method required holding time and the QC is compliant. Results are reported from both trials.

### Sample Comments

State of Washington Lab Certification No. C457  
Carcinogenic PAHs have been reported for this sample

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	18269WAE026	09/29/2018 22:18	Kira N Beck	1

**Sample Description:** MW-530-W-180920 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9815405  
**ELLE Group #:** 1990016  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submittal Date/Time:** 09/21/2018 10:30

**Collection Date/Time:** 09/20/2018 08:35

## Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10466	BNA Water Extraction SIM	SW-846 3510C	1	18269WAE026	09/26/2018 16:40	Osvaldo R Sanchez	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18269B94A	10/01/2018 19:20	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18269B94A	10/01/2018 19:20	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18269B94A	10/01/2018 19:20	Jeremy C Giffin	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	182750019A	10/05/2018 22:23	Marisa Englebright	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	2-RE	182820002A	10/18/2018 06:12	Marisa Englebright	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	182750019A	10/01/2018 21:00	Mathias Okpo	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	2	182820002A	10/09/2018 22:00	Mathias Okpo	1

**Sample Description:** DUP-4-WD-180920 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9815406  
**ELLE Group #:** 1990016  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 09/21/2018 10:30  
**Collection Date/Time:** 09/20/2018

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270D SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14244	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14244	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14244	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14244	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14244	Chrysene	218-01-9	N.D.	0.01	1
14244	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1

The recovery for a target analyte(s) in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary. Since the recovery is high and the target analyte(s) was not detected in the sample, the data is reported.

<b>GC Volatiles</b>		<b>ECY 97-602 NWT PH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWT PH-Gx water C7-C12	n.a.	N.D.	19	1

<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1

<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWT PH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	46	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1

**Trial ID: RE**

12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	46	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1

The recovery for a target analyte(s) and surrogate in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary.  
The recovery for the sample surrogate(s) is outside the QC acceptance limits as noted on the QC Summary.  
The recovery for the method blank surrogate(s) is outside the QC acceptance limits as noted on the QC Summary.  
The following action was taken:  
The sample was re-extracted outside the method required holding time and the QC is compliant. Results are reported from both trials.

### Sample Comments

State of Washington Lab Certification No. C457  
Carcinogenic PAHs have been reported for this sample

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	18269WAE026	09/29/2018 22:46	Kira N Beck	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18269WAE026	09/26/2018 16:40	Oswaldo R Sanchez	1

**Sample Description:** DUP-4-WD-180920 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9815406  
**ELLE Group #:** 1990016  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submittal Date/Time:** 09/21/2018 10:30  
**Collection Date/Time:** 09/20/2018

## Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18269B94A	10/01/2018 20:36	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18269B94A	10/01/2018 20:36	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18269B94A	10/01/2018 20:36	Jeremy C Giffin	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	182750019A	10/05/2018 22:46	Marisa Englebright	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	2-RE	182820002A	10/18/2018 06:35	Marisa Englebright	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	182750019A	10/01/2018 21:00	Mathias Okpo	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	2	182820002A	10/09/2018 22:00	Mathias Okpo	1

**Sample Description:** QA-T-180920 NA Water  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9815407  
**ELLE Group #:** 1990016  
**Matrix:** Water

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 09/21/2018 10:30  
**Collection Date/Time:** 09/20/2018

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC Volatiles</b>					
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx n.a.	ug/l N.D.	ug/l 19	1
<b>GC Volatiles</b>					
02102	Benzene	SW-846 8021B 71-43-2	ug/l N.D.	ug/l 0.5	1

### Sample Comments

State of Washington Lab Certification No. C457

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18269B94A	10/01/2018 17:12	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18269B94A	10/01/2018 17:12	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18269B94A	10/01/2018 17:12	Jeremy C Giffin	1



## Quality Control Summary

Client Name: Chevron Environmental Mgmt Co  
Reported: 10/23/2018 11:00

Group Number: 1990016

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

### Method Blank

Analysis Name	Result ug/l	MDL ug/l
Batch number: 18268WAB026	Sample number(s): 9815394-9815395	
Benzo(a)anthracene	N.D.	0.01
Benzo(a)pyrene	N.D.	0.01
Benzo(b)fluoranthene	N.D.	0.01
Benzo(k)fluoranthene	N.D.	0.01
Chrysene	N.D.	0.01
Dibenz(a,h)anthracene	N.D.	0.02
Indeno(1,2,3-cd)pyrene	N.D.	0.01
Batch number: 18269WAE026	Sample number(s): 9815396-9815406	
Benzo(a)anthracene	N.D.	0.01
Benzo(a)pyrene	N.D.	0.01
Benzo(b)fluoranthene	N.D.	0.01
Benzo(k)fluoranthene	N.D.	0.01
Chrysene	N.D.	0.01
Dibenz(a,h)anthracene	N.D.	0.02
Indeno(1,2,3-cd)pyrene	N.D.	0.01
Batch number: 18268A94A	Sample number(s): 9815394-9815403	
Benzene	N.D.	0.03
NWTPH-Gx water C7-C12	N.D.	19
Batch number: 18269B94A	Sample number(s): 9815404-9815407	
Benzene	N.D.	0.03
NWTPH-Gx water C7-C12	N.D.	19
Batch number: 182740022A	Sample number(s): 9815394-9815402	
DX DRO C12-C24 w/ SiGel	N.D.	45
DX HRO C24-C40 w/ SiGel	N.D.	100
Batch number: 182750019A	Sample number(s): 9815403-9815406	
DX DRO C12-C24 w/ SiGel	N.D.	45
DX HRO C24-C40 w/ SiGel	N.D.	100
Batch number: 182820002A	Sample number(s): 9815403-9815406	
DX DRO C12-C24 w/ SiGel	N.D.	45
DX HRO C24-C40 w/ SiGel	N.D.	100

### LCS/LCSD

\*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

## Quality Control Summary

Client Name: Chevron Environmental Mgmt Co  
Reported: 10/23/2018 11:00

Group Number: 1990016

### LCS/LCSD

Analysis Name	LCS Spike Added ug/l	LCS Conc ug/l	LCSD Spike Added ug/l	LCSD Conc ug/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: 18268WAB026	Sample number(s): 9815394-9815395								
Benzo(a)anthracene	1.00	1.14			114*		67-111		
Benzo(a)pyrene	1.00	1.10			110		69-121		
Benzo(b)fluoranthene	1.00	1.17			117		70-123		
Benzo(k)fluoranthene	1.00	1.06			106		66-120		
Chrysene	1.00	0.984			98		66-109		
Dibenz(a,h)anthracene	1.00	1.10			110		55-123		
Indeno(1,2,3-cd)pyrene	1.00	1.15			115		52-124		
Batch number: 18269WAE026	Sample number(s): 9815396-9815406								
Benzo(a)anthracene	1.00	1.17			117*		67-111		
Benzo(a)pyrene	1.00	1.18			118		69-121		
Benzo(b)fluoranthene	1.00	1.19			119		70-123		
Benzo(k)fluoranthene	1.00	1.19			119		66-120		
Chrysene	1.00	1.15			115*		66-109		
Dibenz(a,h)anthracene	1.00	1.14			114		55-123		
Indeno(1,2,3-cd)pyrene	1.00	1.15			115		52-124		
	ug/l	ug/l	ug/l	ug/l					
Batch number: 18268A94A	Sample number(s): 9815394-9815403								
Benzene	20	20.65			103		80-120		
NWTPH-Gx water C7-C12	1100	1419.56			129		64-131		
Batch number: 18269B94A	Sample number(s): 9815404-9815407								
Benzene	20	20.09			100		80-120		
NWTPH-Gx water C7-C12	1100	1407.99			128		64-131		
	ug/l	ug/l	ug/l	ug/l					
Batch number: 182740022A	Sample number(s): 9815394-9815402								
DX DRO C12-C24 w/ SiGel	602.24	226.09			38		10-115		
Batch number: 182750019A	Sample number(s): 9815403-9815406								
DX DRO C12-C24 w/ SiGel	602.24	N.D.	602.24	N.D.	0*	0*	10-115	0	20
Batch number: 182820002A	Sample number(s): 9815403-9815406								
DX DRO C12-C24 w/ SiGel	600.14	178.99	600.14	221.71	30	37	10-115	21*	20

### MS/MSD

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc	MS Spike Added	MS Conc	MSD Spike Added	MSD Conc	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
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\*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

## Quality Control Summary

Client Name: Chevron Environmental Mgmt Co  
Reported: 10/23/2018 11:00

Group Number: 1990016

### MS/MSD

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc ug/l	MS Spike Added ug/l	MS Conc ug/l	MSD Spike Added ug/l	MSD Conc ug/l	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Batch number: 18269WAE026	Sample number(s): 9815396-9815406 UNSPK: 9815397									
Benzo(a)anthracene	N.D.	1.10	1.21	1.10	1.10	111	100	67-111	10	30
Benzo(a)pyrene	N.D.	1.10	1.01	1.10	0.893	92	81	69-121	12	30
Benzo(b)fluoranthene	N.D.	1.10	1.14	1.10	1.06	104	96	70-123	7	30
Benzo(k)fluoranthene	N.D.	1.10	1.13	1.10	1.03	103	94	66-120	9	30
Chrysene	N.D.	1.10	1.20	1.10	1.09	110*	99	66-109	10	30
Dibenz(a,h)anthracene	N.D.	1.10	0.770	1.10	0.688	70	63	55-123	11	30
Indeno(1,2,3-cd)pyrene	N.D.	1.10	0.863	1.10	0.760	79	69	52-124	13	30
	ug/l	ug/l	ug/l	ug/l	ug/l					
Batch number: 18268A94A	Sample number(s): 9815394-9815403 UNSPK: 9815397									
Benzene	N.D.	20	21.62	20	21.77	108	109	80-120	1	30
NWTPH-Gx water C7-C12	N.D.	1100	1488.01	1100	1494.19	135*	136*	64-131	0	30
Batch number: 18269B94A	Sample number(s): 9815404-9815407 UNSPK: 9815404, 9815405									
Benzene	N.D.	20	21.1	20	21.66	106	108	80-120	3	30
NWTPH-Gx water C7-C12	N.D.	1100	1464.79	1100	1485.92	133*	135*	64-131	1	30
	ug/l	ug/l	ug/l	ug/l	ug/l					
Batch number: 182740022A	Sample number(s): 9815394-9815402 UNSPK: 9815397									
DX DRO C12-C24 w/ SiGel	N.D.	646.18	181.5	654.61	195.99	28*	30	30-115	8	20

### Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: SIM SVOAs 8270D MINI  
Batch number: 18268WAB026

	Fluoranthene-d10	Benzo(a)pyrene-d12	1-Methylnaphthalene-d10
9815394	88	87	81
9815395	83	74	72
Blank	116	113	84
LCS	84	101	82
Limits:	38-119	18-129	29-112

Analysis Name: SIM SVOAs 8270D MINI  
Batch number: 18269WAE026

\*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

## Quality Control Summary

Client Name: Chevron Environmental Mgmt Co  
Reported: 10/23/2018 11:00

Group Number: 1990016

### Surrogate Quality Control (continued)

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: SIM SVOAs 8270D MINI

Batch number: 18269WAE026

	Fluoranthene-d10	Benzo(a)pyrene-d12	1-Methylnaphthalene-d10
9815396	81	90	82
9815397	77	67	75
9815398	81	79	86
9815399	74	67	67
9815400	79	73	81
9815401	62	63	52
9815402	76	75	80
9815403	78	44	78
9815404	80	46	82
9815405	83	71	77
9815406	76	69	80
Blank	96	106	92
LCS	87	101	89
MS	81	79	86
MSD	74	67	67
Limits:	38-119	18-129	29-112

Analysis Name: Method 8021 Water Master

Batch number: 18268A94A

	Trifluorotoluene-P	Trifluorotoluene-F
9815394	87	80
9815395	87	80
9815396	87	80
9815397	87	88
9815398	85	94
9815399	85	95
9815400	87	80
9815401	87	79
9815402	88	79
9815403	88	79
Blank	88	83
LCS	88	101
MS	85	94
MSD	85	95
Limits:	51-120	50-150

Analysis Name: Method 8021 Water Master

Batch number: 18269B94A

\*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

## Quality Control Summary

Client Name: Chevron Environmental Mgmt Co  
Reported: 10/23/2018 11:00

Group Number: 1990016

### Surrogate Quality Control (continued)

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: Method 8021 Water Master  
Batch number: 18269B94A

	Trifluorotoluene-P	Trifluorotoluene-F
9815404	87	81
9815405	87	80
9815406	87	80
9815407	90	80
Blank	88	81
LCS	85	99
MS	85	96
MSD	86	96
Limits:	51-120	50-150

Analysis Name: NWTPH-Dx water w/Si Gel  
Batch number: 182740022A

	Orthoterphenyl	Capric Acid
9815394	46*	0
Limits:	50-150	0-1

	Orthoterphenyl
9815395	77
9815396	65
9815397	78
9815398	67
9815399	64
9815400	82
9815401	66
9815402	81
Blank	67
LCS	75
MS	67
MSD	64
Limits:	50-150

Analysis Name: NWTPH-Dx water w/Si Gel  
Batch number: 182750019A

	Orthoterphenyl	Capric Acid
9815403	0*	0
9815404	0*	0
9815405	0*	0
9815406	0*	0

\*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

## Quality Control Summary

Client Name: Chevron Environmental Mgmt Co  
Reported: 10/23/2018 11:00

Group Number: 1990016

### Surrogate Quality Control (continued)

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: NWTPH-Dx water w/Si Gel  
Batch number: 182750019A

	Orthoterphenyl	Capric Acid
Blank	0*	0
LCS	0*	0
LCSD	0*	0
Limits:	50-150	0-1

Analysis Name: NWTPH-Dx water w/Si Gel  
Batch number: 182820002A

	Orthoterphenyl	Capric Acid
9815403RE	89	0
9815404RE	92	0
9815405RE	91	0
9815406RE	85	0
Blank	84	0
LCS	60	0
LCSD	80	0
Limits:	50-150	0-1

\*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

# Chevron Northwest Region Analysis Request/Chain of Custody



**Lancaster Laboratories**

Acct. # 11964

For Lancaster Laboratories use only  
 Group # 1990016 Sample # 9815394-407  
 Instructions on reverse side correspond with circled numbers.

1 Client Information		4 Matrix		5 Analyses Requested	
Facility # <u>Edmonds Terminal</u> WBS <u>NWENPUG00143D802</u>		Soil <input type="checkbox"/> Sediment <input type="checkbox"/> Potable <input type="checkbox"/> Ground <input checked="" type="checkbox"/> NPDES <input type="checkbox"/> Surface <input type="checkbox"/> Oil <input type="checkbox"/> Air <input type="checkbox"/>	Total Number of Containers BTEX+MTBE <input checked="" type="checkbox"/> 8021B <input type="checkbox"/> 8260 <input type="checkbox"/> Naphth 8260 full scan Oxygenates NWTPH GX NWTPH DX <input type="checkbox"/> Silica Gel Cleanup <input checked="" type="checkbox"/> Lead Total <input type="checkbox"/> Diss. <input type="checkbox"/> Method WAVPH <input type="checkbox"/> WAEPH <input type="checkbox"/> CPATS by USEPA 8270 SIM		
Site Address <u>11720 UNOCO Rd, Edmonds, WA</u>					
Chevron PM <u>Kim Jolitz</u> Lead Consultant <u>Arcadis</u>					
Consultant/Office <u>1100 Olive way, Suite 800, Seattle, WA</u>					
Consultant Project Mgr. <u>Scott Zorn</u>					
Consultant Phone #					
Sampler <u>Eric Krueger, Jason Little, Ross Labrandeur</u>					

SCR #: \_\_\_\_\_

- Results in Dry Weight
- J value reporting needed
- Must meet lowest detection limits possible for 8260 compounds
- 8021 MTBE Confirmation
- Confirm MTBE + Naphthalene
- Confirm highest hit by 8260
- Confirm all hits by 8260
- Run \_\_\_\_\_ oxy's on highest hit
- Run \_\_\_\_\_ oxy's on all hits

2 Sample Identification	3 Collected		Grab	Composite	4 Matrix					Total Number of Containers	5 Analyses Requested							6 Remarks						
	Date	Time			Soil	Water	Potable	NPDES	Oil		Air	BTEX+MTBE	8021B	8260	Naphth	Oxygenates	NWTPH GX		NWTPH DX	Silica Gel Cleanup	Lead	Total	Diss.	Method
LM-2	9/20/18	0845								10														* Use Standard Silica Gel cleanup
MW-502		1145								10														
MW-503		1030								10														
MW-504		0950								10														
MW-504 MS/MSD		0950								20														
MW-505		0955								10														
MW-511		0900								10														
MW-512		1215								10														
MW-513		1130								10														
MW-514		1110								10														
MW-530		0835								10														
DUP-4										10														
Trip Blank										2														

7 Turnaround Time Requested (TAT) (please circle)

Standard 5 day      4 day

72 hour      48 hour      24 hour

Relinquished by <u>[Signature]</u>	Date <u>9/20/18</u>	Time	Received by <u>[Signature]</u>	Date	Time
Relinquished by _____	Date _____	Time _____	Received by _____	Date _____	Time _____

8 Data Package Options (please circle if required)

Type I - Full      Type VI (Raw Data)

Relinquished by Commerical Carrier:			Received by <u>[Signature]</u>		Date <u>9-21-18</u>	Time <u>(030)</u>
UPS _____	FedEx _____	Other _____	Temperature Upon Receipt <u>0.4/0.0</u> °C		Custody Seals Intact? <u>Yes</u> No	



Client: Arcadis

**Delivery and Receipt Information**

Delivery Method: Fed Ex                      Arrival Timestamp: 09/21/2018 10:30  
 Number of Packages: 3                              Number of Projects: 1  
 State/Province of Origin: WA

**Arrival Condition Summary**

Shipping Container Sealed:	Yes	Sample IDs on COC match Containers:	No
Custody Seal Present:	Yes	Sample Date/Times match COC:	Yes
Custody Seal Intact:	Yes	VOA Vial Headspace $\geq$ 6mm:	No
Samples Chilled:	Yes	Total Trip Blank Qty:	2
Paperwork Enclosed:	Yes	Trip Blank Type:	HCI
Samples Intact:	Yes	Air Quality Samples Present:	No
Missing Samples:	No		
Extra Samples:	No		
Discrepancy in Container Qty on COC:	No		

*Unpacked by Melvin Sanchez (8943) at 15:51 on 09/21/2018*

**Samples Chilled Details**

Thermometer Types:    *DT = Digital (Temp. Bottle)*    *IR = Infrared (Surface Temp)*    *All Temperatures in °C.*

Cooler #	Thermometer ID	Corrected Temp	Therm. Type	Ice Type	Ice Present?	Ice Container	Elevated Temp?
1	DT131	0.4	DT	Wet	Y	Bagged	N
2	DT131	2.0	DT	Wet	Y	Bagged	N
3	DT131	1.4	DT	Wet	Y	Bagged	N

**Sample ID Discrepancy Details**

Sample ID on COC	Sample ID on Label	Comments
MW-513	MW-520	Only two of the vials.



# Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

<b>BMQL</b>	Below Minimum Quantitation Level	<b>mL</b>	milliliter(s)
<b>C</b>	degrees Celsius	<b>MPN</b>	Most Probable Number
<b>cfu</b>	colony forming units	<b>N.D.</b>	non-detect
<b>CP Units</b>	cobalt-chloroplatinate units	<b>ng</b>	nanogram(s)
<b>F</b>	degrees Fahrenheit	<b>NTU</b>	nephelometric turbidity units
<b>g</b>	gram(s)	<b>pg/L</b>	picogram/liter
<b>IU</b>	International Units	<b>RL</b>	Reporting Limit
<b>kg</b>	kilogram(s)	<b>TNTC</b>	Too Numerous To Count
<b>L</b>	liter(s)	<b>µg</b>	microgram(s)
<b>lb.</b>	pound(s)	<b>µL</b>	microliter(s)
<b>m3</b>	cubic meter(s)	<b>umhos/cm</b>	micromhos/cm
<b>meq</b>	milliequivalents	<b>MCL</b>	Maximum Contamination Limit
<b>mg</b>	milligram(s)		
<b>&lt;</b>	less than		
<b>&gt;</b>	greater than		
<b>ppm</b>	parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.		
<b>ppb</b>	parts per billion		
<b>Dry weight basis</b>	Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.		

**Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.**

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

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Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as “analyze immediately” are not performed within 15 minutes.

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# Data Qualifiers

Qualifier	Definition
C	Result confirmed by reanalysis
D1	Indicates for dual column analyses that the result is reported from column 1
D2	Indicates for dual column analyses that the result is reported from column 2
E	Concentration exceeds the calibration range
K1	Initial Calibration Blank is above the QC limit and the sample result is ND
K2	Continuing Calibration Blank is above the QC limit and the sample result is ND
K3	Initial Calibration Verification is above the QC limit and the sample result is ND
K4	Continuing Calibration Verification is above the QC limit and the sample result is ND
J (or G, I, X)	Estimated value $\geq$ the Method Detection Limit (MDL or DL) and $<$ the Limit of Quantitation (LOQ or RL)
P	Concentration difference between the primary and confirmation column $>40\%$ . The lower result is reported.
P^	Concentration difference between the primary and confirmation column $> 40\%$ . The higher result is reported.
U	Analyte was not detected at the value indicated
V	Concentration difference between the primary and confirmation column $>100\%$ . The reporting limit is raised due to this disparity and evident interference.
W	The dissolved oxygen uptake for the unseeded blank is greater than 0.20 mg/L.
Z	Laboratory Defined - see analysis report

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods. Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.



## ANALYSIS REPORT

Prepared by:

Eurofins Lancaster Laboratories Environmental  
2425 New Holland Pike  
Lancaster, PA 17601

Prepared for:

Chevron Environmental Mgmt Co  
BR1 X5139C  
6101 Bollinger Canyon Road  
San Ramon CA 94583

Report Date: December 17, 2018 17:08

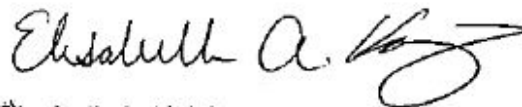
### Project: Edmonds Terminal

Account #: 11964  
Group Number: 2012877  
PO Number: 0015268291  
Release Number: JOLITZ  
State of Sample Origin: WA

Electronic Copy To Arcadis  
Electronic Copy To ARCADIS U.S., Inc.  
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Electronic Copy To Arcadis

Attn: Scott Zorn  
Attn: Sam Miles  
Attn: Jason Little  
Attn: Ryan Brauchla  
Attn: Ophelie Encelle  
Attn: Eric Krueger

Respectfully Submitted,



Elisabeth A. Knisley  
Project Manager

(717) 556-7262

To view our laboratory's current scopes of accreditation please go to <http://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster-laboratories-environmental/resources/certifications/>. Historical copies may be requested through your project manager.



## SAMPLE INFORMATION

<u>Client Sample Description</u>	<u>Sample Collection Date/Time</u>	<u>ELLE#</u>
LM-2-W-181127 Grab Groundwater	11/27/2018 14:25	9914791
MW-104-W-181127 Grab Groundwater	11/27/2018 11:15	9914792
MW-525-W-181127 Grab Groundwater	11/27/2018 10:35	9914793
MW-526-W-181127 Grab Groundwater	11/27/2018 09:00	9914794
MW-530-W-181127 Grab Groundwater	11/27/2018 13:40	9914795
MW-531-W-181127 Grab Groundwater	11/27/2018 10:25	9914796
MW-532-W-181127 Grab Groundwater	11/27/2018 10:30	9914797
MW-533-W-181127 Grab Groundwater	11/27/2018 11:30	9914798
MW-535-W-181127 Grab Groundwater	11/27/2018 11:20	9914799
MW-ER-W-181127 Grab Groundwater	11/27/2018 12:35	9914800
QA-T-181127 NA Water	11/27/2018	9914801

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

**Sample Description:** LM-2-W-181127 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9914791  
**ELLE Group #:** 2012877  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 11/28/2018 11:00  
**Collection Date/Time:** 11/27/2018 14:25

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270D SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14244	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14244	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14244	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14244	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14244	Chrysene	218-01-9	N.D.	0.01	1
14244	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	190	10
<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	5.0	10
Reporting limits were raised due to sample foaming.					
<b>GC Miscellaneous</b>		<b>RSKSOP-175 modified</b>	<b>ug/l</b>	<b>ug/l</b>	
07105	Methane	74-82-8	640	15	5
<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	46	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1
<b>Metals Dissolved</b>		<b>EPA 200.8 rev 5.4</b>	<b>ug/l</b>	<b>ug/l</b>	
06037	Manganese	7439-96-5	96.6	4.9	1
<b>Wet Chemistry</b>		<b>EPA 300.0</b>	<b>ug/l</b>	<b>ug/l</b>	
00368	Nitrate Nitrogen	14797-55-8	N.D.	250	5
00228	Sulfate	14808-79-8	93,200	15,000	50

### Sample Comments

State of Washington Lab Certification No. C457  
This sample was field filtered for dissolved metals.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	18333WAE026	11/30/2018 08:14	Catherine E Bachman	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18333WAE026	11/29/2018 16:41	Kate E Lutte	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18337A94A	12/04/2018 05:20	Jeremy C Giffin	10
02102	Method 8021 Water Master	SW-846 8021B	1	18337A94A	12/04/2018 05:20	Jeremy C Giffin	10
01146	GC VOA Water Prep	SW-846 5030B	1	18337A94A	12/04/2018 05:19	Jeremy C Giffin	10
07105	Volatile Headspace Hydrocarbon	RSKSOP-175 modified	1	183330019A	11/30/2018 16:52	Johanna C Kennedy	5

**Sample Description:** LM-2-W-181127 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9914791  
**ELLE Group #:** 2012877  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submittal Date/Time:** 11/28/2018 11:00

**Collection Date/Time:** 11/27/2018 14:25

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	183380003A	12/06/2018 23:01	Thomas C Wildermuth	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	183380003A	12/04/2018 18:00	Mathias Okpo	1
06037	Manganese	EPA 200.8 rev 5.4	1	183340705005A	12/03/2018 05:28	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	183340705005	11/30/2018 15:40	JoElla L Rice	1
00368	Nitrate Nitrogen	EPA 300.0	1	18332837106B	11/29/2018 03:42	Clinton M Wilson	5
00228	Sulfate	EPA 300.0	1	18332837106B	11/29/2018 04:01	Clinton M Wilson	50

**Sample Description:** MW-104-W-181127 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9914792  
**ELLE Group #:** 2012877  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 11/28/2018 11:00

**Collection Date/Time:** 11/27/2018 11:15

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>					
		<b>SW-846 8270D SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14244	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14244	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14244	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14244	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14244	Chrysene	218-01-9	N.D.	0.01	1
14244	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>					
		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	36	19	1
<b>GC Volatiles</b>					
		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1
<b>GC Miscellaneous</b>					
		<b>RSKSOP-175 modified</b>	<b>ug/l</b>	<b>ug/l</b>	
07105	Methane	74-82-8	960	15	5
<b>GC Petroleum Hydrocarbons w/Si</b>					
		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	47	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1
<b>Metals Dissolved</b>					
		<b>EPA 200.8 rev 5.4</b>	<b>ug/l</b>	<b>ug/l</b>	
06037	Manganese	7439-96-5	380	4.9	1
<b>Wet Chemistry</b>					
		<b>EPA 300.0</b>	<b>ug/l</b>	<b>ug/l</b>	
00368	Nitrate Nitrogen	14797-55-8	N.D.	250	5
00228	Sulfate	14808-79-8	7,400	1,500	5

### Sample Comments

State of Washington Lab Certification No. C457  
This sample was field filtered for dissolved metals.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	18333WAE026	11/30/2018 08:43	Catherine E Bachman	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18333WAE026	11/29/2018 16:41	Kate E Lutte	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18334A94A	12/01/2018 21:08	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18334A94A	12/01/2018 21:08	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18334A94A	12/01/2018 21:07	Jeremy C Giffin	1
07105	Volatile Headspace Hydrocarbon	RSKSOP-175 modified	1	183330018A	11/30/2018 18:45	Johanna C Kennedy	5

**Sample Description:** MW-104-W-181127 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9914792  
**ELLE Group #:** 2012877  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submittal Date/Time:** 11/28/2018 11:00

**Collection Date/Time:** 11/27/2018 11:15

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	183380003A	12/06/2018 23:24	Thomas C Wildermuth	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	183380003A	12/04/2018 18:00	Mathias Okpo	1
06037	Manganese	EPA 200.8 rev 5.4	1	183340705008A	12/10/2018 06:59	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	183340705008	12/03/2018 04:33	James L Mertz	1
00368	Nitrate Nitrogen	EPA 300.0	1	18332837106B	11/29/2018 02:48	Clinton M Wilson	5
00228	Sulfate	EPA 300.0	1	18332837106B	11/29/2018 02:48	Clinton M Wilson	5



**Sample Description:** MW-525-W-181127 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9914793  
**ELLE Group #:** 2012877  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submittal Date/Time:** 11/28/2018 11:00  
**Collection Date/Time:** 11/27/2018 10:35

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>					
<b>SW-846 8270D SIM</b>			<b>ug/l</b>	<b>ug/l</b>	
14244	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14244	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14244	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14244	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14244	Chrysene	218-01-9	N.D.	0.01	1
14244	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	0.01	0.01	1
<b>GC Volatiles</b>					
<b>ECY 97-602 NWTPH-Gx</b>			<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	19	1
<b>GC Volatiles</b>					
<b>SW-846 8021B</b>			<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1
<b>GC Miscellaneous</b>					
<b>RSKSOP-175 modified</b>			<b>ug/l</b>	<b>ug/l</b>	
07105	Methane	74-82-8	45	3.0	1
<b>GC Petroleum Hydrocarbons w/Si</b>					
<b>ECY 97-602 NWTPH-Dx modified</b>			<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	130	46	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1
Surrogate recoveries were confirmed by re-extraction outside of method hold time. The original trial results are reported here.					
The reverse surrogate, capric acid, is present at <1%.					
<b>Metals Dissolved</b>					
<b>EPA 200.8 rev 5.4</b>			<b>ug/l</b>	<b>ug/l</b>	
06037	Manganese	7439-96-5	92.9	4.9	1
<b>Wet Chemistry</b>					
<b>EPA 300.0</b>			<b>ug/l</b>	<b>ug/l</b>	
00368	Nitrate Nitrogen	14797-55-8	540	250	5
00228	Sulfate	14808-79-8	24,200	1,500	5

### Sample Comments

State of Washington Lab Certification No. C457  
This sample was field filtered for dissolved metals.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	18333WAE026	11/30/2018 09:13	Catherine E Bachman	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18333WAE026	11/29/2018 16:41	Kate E Lutte	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18334A94A	12/01/2018 18:12	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18334A94A	12/01/2018 18:12	Jeremy C Giffin	1

**Sample Description:** MW-525-W-181127 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9914793  
**ELLE Group #:** 2012877  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submittal Date/Time:** 11/28/2018 11:00  
**Collection Date/Time:** 11/27/2018 10:35

## Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
01146	GC VOA Water Prep	SW-846 5030B	1	18334A94A	12/01/2018 18:11	Jeremy C Giffin	1
07105	Volatile Headspace Hydrocarbon	RSKSOP-175 modified	1	183330018A	11/29/2018 17:08	Johanna C Kennedy	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	183380003A	12/06/2018 23:47	Thomas C Wildermuth	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	183380003A	12/04/2018 18:00	Mathias Okpo	1
06037	Manganese	EPA 200.8 rev 5.4	1	183340705008A	12/10/2018 07:09	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	183340705008	12/03/2018 04:33	James L Mertz	1
00368	Nitrate Nitrogen	EPA 300.0	1	18332837106B	11/29/2018 04:19	Clinton M Wilson	5
00228	Sulfate	EPA 300.0	1	18332837106B	11/29/2018 04:19	Clinton M Wilson	5

**Sample Description:** MW-526-W-181127 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9914794  
**ELLE Group #:** 2012877  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 11/28/2018 11:00  
**Collection Date/Time:** 11/27/2018 09:00

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>					
		<b>SW-846 8270D SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14244	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14244	Benzo(a)pyrene	50-32-8	0.04	0.01	1
14244	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14244	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14244	Chrysene	218-01-9	N.D.	0.01	1
14244	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	0.02	0.01	1
The surrogate data is outside the QC limits due to unresolvable matrix problems evident in the sample chromatogram.					
<b>GC Volatiles</b>					
		<b>ECY 97-602 NWT PH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWT PH-Gx water C7-C12	n.a.	84	19	1
<b>GC Volatiles</b>					
		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1
<b>GC Miscellaneous</b>					
		<b>RSKSOP-175 modified</b>	<b>ug/l</b>	<b>ug/l</b>	
07105	Methane	74-82-8	N.D.	3.0	1
<b>GC Petroleum Hydrocarbons w/Si</b>					
		<b>ECY 97-602 NWT PH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	8,800	90	2
12917	DX HRO C24-C40 w/ SiGel	n.a.	1,400	200	2
The reverse surrogate, capric acid, is present at <1%.					
<b>Metals Dissolved</b>					
		<b>EPA 200.8 rev 5.4</b>	<b>ug/l</b>	<b>ug/l</b>	
06037	Manganese	7439-96-5	414	4.9	1
<b>Wet Chemistry</b>					
		<b>EPA 300.0</b>	<b>ug/l</b>	<b>ug/l</b>	
00368	Nitrate Nitrogen	14797-55-8	4,000	250	5
00228	Sulfate	14808-79-8	68,500	1,500	5

### Sample Comments

State of Washington Lab Certification No. C457  
This sample was field filtered for dissolved metals.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	18333WAE026	11/30/2018 09:42	Catherine E Bachman	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18333WAE026	11/29/2018 16:41	Kate E Lutte	1
08274	NWT PH-Gx water C7-C12	ECY 97-602 NWT PH-Gx	1	18334A94A	12/01/2018 21:34	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18334A94A	12/01/2018 21:34	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18334A94A	12/01/2018 21:33	Jeremy C Giffin	1

**Sample Description:** MW-526-W-181127 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9914794  
**ELLE Group #:** 2012877  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submittal Date/Time:** 11/28/2018 11:00

**Collection Date/Time:** 11/27/2018 09:00

## Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07105	Volatile Headspace Hydrocarbon	RSKSOP-175 modified	1	183330018A	11/29/2018 17:26	Johanna C Kennedy	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	183380003A	12/08/2018 00:28	Thomas C Wildermuth	2
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	183380003A	12/04/2018 18:00	Mathias Okpo	1
06037	Manganese	EPA 200.8 rev 5.4	1	183340705008A	12/10/2018 07:12	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	183340705008	12/03/2018 04:33	James L Mertz	1
00368	Nitrate Nitrogen	EPA 300.0	1	18332837106B	11/29/2018 05:32	Clinton M Wilson	5
00228	Sulfate	EPA 300.0	1	18332837106B	11/29/2018 05:32	Clinton M Wilson	5

**Sample Description:** MW-530-W-181127 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9914795  
**ELLE Group #:** 2012877  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 11/28/2018 11:00  
**Collection Date/Time:** 11/27/2018 13:40

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>					
<b>SW-846 8270D SIM</b>			<b>ug/l</b>	<b>ug/l</b>	
14244	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14244	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14244	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14244	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14244	Chrysene	218-01-9	N.D.	0.01	1
14244	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>					
<b>ECY 97-602 NWTPH-Gx</b>			<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	19	1
<b>GC Volatiles</b>					
<b>SW-846 8021B</b>			<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1
<b>GC Miscellaneous</b>					
<b>RSKSOP-175 modified</b>			<b>ug/l</b>	<b>ug/l</b>	
07105	Methane	74-82-8	10	3.0	1
<b>GC Petroleum Hydrocarbons w/Si</b>					
<b>ECY 97-602 NWTPH-Dx modified</b>			<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	45	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1
<b>Metals Dissolved</b>					
<b>EPA 200.8 rev 5.4</b>			<b>ug/l</b>	<b>ug/l</b>	
06037	Manganese	7439-96-5	90.8	4.9	1
<b>Wet Chemistry</b>					
<b>EPA 300.0</b>			<b>ug/l</b>	<b>ug/l</b>	
00368	Nitrate Nitrogen	14797-55-8	N.D.	250	5
00228	Sulfate	14808-79-8	935,000	150,000	500

### Sample Comments

State of Washington Lab Certification No. C457  
This sample was field filtered for dissolved metals.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	18333WAE026	11/30/2018 10:12	Catherine E Bachman	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18333WAE026	11/29/2018 16:41	Kate E Lutte	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18334A94A	12/01/2018 21:59	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18334A94A	12/01/2018 21:59	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18334A94A	12/01/2018 21:58	Jeremy C Giffin	1
07105	Volatile Headspace Hydrocarbon	RSKSOP-175 modified	1	183330018A	11/29/2018 17:44	Johanna C Kennedy	1

**Sample Description:** MW-530-W-181127 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9914795  
**ELLE Group #:** 2012877  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submittal Date/Time:** 11/28/2018 11:00

**Collection Date/Time:** 11/27/2018 13:40

## Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	183380003A	12/07/2018 00:32	Thomas C Wildermuth	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	183380003A	12/04/2018 18:00	Mathias Okpo	1
06037	Manganese	EPA 200.8 rev 5.4	1	183340705008A	12/10/2018 07:14	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	183340705008	12/03/2018 04:33	James L Mertz	1
00368	Nitrate Nitrogen	EPA 300.0	1	18332837106B	11/29/2018 06:08	Clinton M Wilson	5
00228	Sulfate	EPA 300.0	1	18332837106B	11/29/2018 06:27	Clinton M Wilson	500

**Sample Description:** MW-531-W-181127 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9914796  
**ELLE Group #:** 2012877  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 11/28/2018 11:00  
**Collection Date/Time:** 11/27/2018 10:25

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270D SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14244	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14244	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14244	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14244	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14244	Chrysene	218-01-9	N.D.	0.01	1
14244	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	19	1
<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1
<b>GC Miscellaneous</b>		<b>RSKSOP-175 modified</b>	<b>ug/l</b>	<b>ug/l</b>	
07105	Methane	74-82-8	N.D.	3.0	1
<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	47	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1
<b>Metals Dissolved</b>		<b>EPA 200.8 rev 5.4</b>	<b>ug/l</b>	<b>ug/l</b>	
06037	Manganese	7439-96-5	N.D.	4.9	1
<b>Wet Chemistry</b>		<b>EPA 300.0</b>	<b>ug/l</b>	<b>ug/l</b>	
00368	Nitrate Nitrogen	14797-55-8	670	250	5
00228	Sulfate	14808-79-8	224,000	15,000	50

### Sample Comments

State of Washington Lab Certification No. C457  
This sample was field filtered for dissolved metals.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	18333WAE026	11/30/2018 10:41	Catherine E Bachman	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18333WAE026	11/29/2018 16:41	Kate E Lutte	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18334A94A	12/01/2018 22:25	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18334A94A	12/01/2018 22:25	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18334A94A	12/01/2018 22:24	Jeremy C Giffin	1
07105	Volatile Headspace Hydrocarbon	RSKSOP-175 modified	1	183330018A	11/29/2018 18:02	Johanna C Kennedy	1

**Sample Description:** MW-531-W-181127 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9914796  
**ELLE Group #:** 2012877  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submittal Date/Time:** 11/28/2018 11:00

**Collection Date/Time:** 11/27/2018 10:25

## Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	183380003A	12/07/2018 00:55	Thomas C Wildermuth	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	183380003A	12/04/2018 18:00	Mathias Okpo	1
06037	Manganese	EPA 200.8 rev 5.4	1	183340705008A	12/10/2018 07:20	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	183340705008	12/03/2018 04:33	James L Mertz	1
00368	Nitrate Nitrogen	EPA 300.0	1	18332837106B	11/29/2018 06:45	Clinton M Wilson	5
00228	Sulfate	EPA 300.0	1	18332837106B	12/01/2018 02:18	Ashlynn M Cornelius	50



**Sample Description:** MW-532-W-181127 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9914797  
**ELLE Group #:** 2012877  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 11/28/2018 11:00  
**Collection Date/Time:** 11/27/2018 10:30

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>					
		<b>SW-846 8270D SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14244	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14244	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14244	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14244	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14244	Chrysene	218-01-9	N.D.	0.01	1
14244	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>					
		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	19	1
<b>GC Volatiles</b>					
		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1
<b>GC Miscellaneous</b>					
		<b>RSKSOP-175 modified</b>	<b>ug/l</b>	<b>ug/l</b>	
07105	Methane	74-82-8	N.D.	3.0	1
<b>GC Petroleum Hydrocarbons w/Si</b>					
		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	46	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1
<b>Metals Dissolved</b>					
		<b>EPA 200.8 rev 5.4</b>	<b>ug/l</b>	<b>ug/l</b>	
06037	Manganese	7439-96-5	16.5	4.9	1
<b>Wet Chemistry</b>					
		<b>EPA 300.0</b>	<b>ug/l</b>	<b>ug/l</b>	
00368	Nitrate Nitrogen	14797-55-8	520	250	5
00228	Sulfate	14808-79-8	51,800	1,500	5

### Sample Comments

State of Washington Lab Certification No. C457  
This sample was field filtered for dissolved metals.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	18333WAE026	11/30/2018 11:11	Catherine E Bachman	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18333WAE026	11/29/2018 16:41	Kate E Lutte	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18334A94A	12/01/2018 22:51	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18334A94A	12/01/2018 22:51	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18334A94A	12/01/2018 22:50	Jeremy C Giffin	1
07105	Volatile Headspace Hydrocarbon	RSKSOP-175 modified	1	183330018A	11/29/2018 18:37	Johanna C Kennedy	1

**Sample Description:** MW-532-W-181127 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9914797  
**ELLE Group #:** 2012877  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submittal Date/Time:** 11/28/2018 11:00

**Collection Date/Time:** 11/27/2018 10:30

## Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	183380003A	12/07/2018 01:17	Thomas C Wildermuth	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	183380003A	12/04/2018 18:00	Mathias Okpo	1
06037	Manganese	EPA 200.8 rev 5.4	1	183340705008A	12/10/2018 07:22	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	183340705008	12/03/2018 04:33	James L Mertz	1
00368	Nitrate Nitrogen	EPA 300.0	1	18332837106B	11/29/2018 07:03	Clinton M Wilson	5
00228	Sulfate	EPA 300.0	1	18332837106B	11/29/2018 07:03	Clinton M Wilson	5

**Sample Description:** MW-533-W-181127 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9914798  
**ELLE Group #:** 2012877  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 11/28/2018 11:00  
**Collection Date/Time:** 11/27/2018 11:30

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>					
		<b>SW-846 8270D SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14244	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14244	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14244	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14244	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14244	Chrysene	218-01-9	N.D.	0.01	1
14244	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>					
		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	19	1
<b>GC Volatiles</b>					
		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1
<b>GC Miscellaneous</b>					
		<b>RSKSOP-175 modified</b>	<b>ug/l</b>	<b>ug/l</b>	
07105	Methane	74-82-8	N.D.	3.0	1
<b>GC Petroleum Hydrocarbons w/Si</b>					
		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	45	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1
<b>Metals Dissolved</b>					
		<b>EPA 200.8 rev 5.4</b>	<b>ug/l</b>	<b>ug/l</b>	
06037	Manganese	7439-96-5	6.6	4.9	1
<b>Wet Chemistry</b>					
		<b>EPA 300.0</b>	<b>ug/l</b>	<b>ug/l</b>	
00368	Nitrate Nitrogen	14797-55-8	520	250	5
00228	Sulfate	14808-79-8	182,000	6,000	20

### Sample Comments

State of Washington Lab Certification No. C457  
This sample was field filtered for dissolved metals.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	18333WAE026	11/30/2018 11:40	Catherine E Bachman	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18333WAE026	11/29/2018 16:41	Kate E Lutte	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18334A94A	12/01/2018 23:16	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18334A94A	12/01/2018 23:16	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18334A94A	12/01/2018 23:15	Jeremy C Giffin	1
07105	Volatile Headspace Hydrocarbon	RSKSOP-175 modified	1	183330018A	11/29/2018 18:55	Johanna C Kennedy	1

**Sample Description:** MW-533-W-181127 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9914798  
**ELLE Group #:** 2012877  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submittal Date/Time:** 11/28/2018 11:00

**Collection Date/Time:** 11/27/2018 11:30

## Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	183380003A	12/07/2018 02:25	Thomas C Wildermuth	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	183380003A	12/04/2018 18:00	Mathias Okpo	1
06037	Manganese	EPA 200.8 rev 5.4	1	183340705008A	12/10/2018 07:25	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	183340705008	12/03/2018 04:33	James L Mertz	1
00368	Nitrate Nitrogen	EPA 300.0	1	18332837106B	11/29/2018 07:40	Clinton M Wilson	5
00228	Sulfate	EPA 300.0	1	18332837106B	12/01/2018 02:37	Ashlynn M Cornelius	20

**Sample Description:** MW-535-W-181127 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9914799  
**ELLE Group #:** 2012877  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 11/28/2018 11:00

**Collection Date/Time:** 11/27/2018 11:20

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>					
		<b>SW-846 8270D SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14244	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14244	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14244	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14244	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14244	Chrysene	218-01-9	N.D.	0.01	1
14244	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>					
		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	19	1
<b>GC Volatiles</b>					
		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1
<b>GC Miscellaneous</b>					
		<b>RSKSOP-175 modified</b>	<b>ug/l</b>	<b>ug/l</b>	
07105	Methane	74-82-8	5.0	3.0	1
<b>GC Petroleum Hydrocarbons w/Si</b>					
		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	46	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1
<b>Metals Dissolved</b>					
		<b>EPA 200.8 rev 5.4</b>	<b>ug/l</b>	<b>ug/l</b>	
06037	Manganese	7439-96-5	15.6	4.9	1
<b>Wet Chemistry</b>					
		<b>EPA 300.0</b>	<b>ug/l</b>	<b>ug/l</b>	
00368	Nitrate Nitrogen	14797-55-8	590	250	5
00228	Sulfate	14808-79-8	387,000	15,000	50

### Sample Comments

State of Washington Lab Certification No. C457  
This sample was field filtered for dissolved metals.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	18333WAE026	11/30/2018 12:10	Catherine E Bachman	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18333WAE026	11/29/2018 16:41	Kate E Lutte	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18334A94A	12/01/2018 23:42	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18334A94A	12/01/2018 23:42	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18334A94A	12/01/2018 23:41	Jeremy C Giffin	1
07105	Volatile Headspace Hydrocarbon	RSKSOP-175 modified	1	183330018A	11/29/2018 19:12	Johanna C Kennedy	1

**Sample Description:** MW-535-W-181127 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9914799  
**ELLE Group #:** 2012877  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submittal Date/Time:** 11/28/2018 11:00

**Collection Date/Time:** 11/27/2018 11:20

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	183380003A	12/07/2018 02:48	Thomas C Wildermuth	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	183380003A	12/04/2018 18:00	Mathias Okpo	1
06037	Manganese	EPA 200.8 rev 5.4	1	183340705008A	12/10/2018 07:27	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	183340705008	12/03/2018 04:33	James L Mertz	1
00368	Nitrate Nitrogen	EPA 300.0	1	18332837106B	11/29/2018 07:58	Clinton M Wilson	5
00228	Sulfate	EPA 300.0	1	18332837106B	12/01/2018 03:31	Ashlynn M Cornelius	50

**Sample Description:** MW-ER-W-181127 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9914800  
**ELLE Group #:** 2012877  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 11/28/2018 11:00  
**Collection Date/Time:** 11/27/2018 12:35

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC Volatiles</b>					
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx n.a.	ug/l 460	ug/l 19	1
<b>GC Volatiles</b>					
02102	Benzene	SW-846 8021B 71-43-2	ug/l N.D.	ug/l 0.5	1
<b>GC Miscellaneous</b>					
07105	Methane	RSKSOP-175 modified 74-82-8	ug/l 9,600	ug/l 300	100
<b>Metals Dissolved</b>					
06037	Manganese	EPA 200.8 rev 5.4 7439-96-5	ug/l 8,130	ug/l 4.9	1
<b>Wet Chemistry</b>					
00368	Nitrate Nitrogen	EPA 300.0 14797-55-8	ug/l N.D.	ug/l 250	5
00228	Sulfate	14808-79-8	N.D.	1,500	5

### Sample Comments

State of Washington Lab Certification No. C457  
This sample was field filtered for dissolved metals.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18334A94A	12/02/2018 00:08	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18334A94A	12/02/2018 00:08	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18334A94A	12/02/2018 00:07	Jeremy C Giffin	1
07105	Volatile Headspace Hydrocarbon	RSKSOP-175 modified	1	183330018A	11/30/2018 19:39	Johanna C Kennedy	100
06037	Manganese	EPA 200.8 rev 5.4	1	183340705008A	12/10/2018 07:29	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	183340705008	12/03/2018 04:33	James L Mertz	1
00368	Nitrate Nitrogen	EPA 300.0	1	18332837106B	11/29/2018 08:16	Clinton M Wilson	5
00228	Sulfate	EPA 300.0	1	18332837106B	11/29/2018 08:16	Clinton M Wilson	5

**Sample Description:** QA-T-181127 NA Water  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9914801  
**ELLE Group #:** 2012877  
**Matrix:** Water

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 11/28/2018 11:00  
**Collection Date/Time:** 11/27/2018

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC Volatiles</b>					
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx n.a.	ug/l N.D.	ug/l 19	1
<b>GC Volatiles</b>					
02102	Benzene	SW-846 8021B 71-43-2	ug/l N.D.	ug/l 0.5	1

### Sample Comments

State of Washington Lab Certification No. C457

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18334A94A	12/01/2018 17:46	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18334A94A	12/01/2018 17:46	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18334A94A	12/01/2018 17:45	Jeremy C Giffin	1



## Quality Control Summary

Client Name: Chevron Environmental Mgmt Co  
Reported: 12/17/2018 17:08

Group Number: 2012877

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

### Method Blank

Analysis Name	Result ug/l	MDL ug/l
Batch number: 18333WAE026	Sample number(s): 9914791-9914799	
Benzo(a)anthracene	N.D.	0.01
Benzo(a)pyrene	N.D.	0.01
Benzo(b)fluoranthene	N.D.	0.01
Benzo(k)fluoranthene	N.D.	0.01
Chrysene	N.D.	0.01
Dibenz(a,h)anthracene	N.D.	0.02
Indeno(1,2,3-cd)pyrene	N.D.	0.01
Batch number: 18334A94A	Sample number(s): 9914792-9914801	
Benzene	N.D.	0.03
NWTPH-Gx water C7-C12	N.D.	19
Batch number: 18337A94A	Sample number(s): 9914791	
Benzene	N.D.	0.03
NWTPH-Gx water C7-C12	N.D.	19
Batch number: 183330018A	Sample number(s): 9914792-9914800	
Methane	N.D.	3.0
Batch number: 183330019A	Sample number(s): 9914791	
Methane	N.D.	3.0
Batch number: 183380003A	Sample number(s): 9914791-9914799	
DX DRO C12-C24 w/ SiGel	N.D.	45
DX HRO C24-C40 w/ SiGel	N.D.	100
Batch number: 183340705005A	Sample number(s): 9914791	
Manganese	N.D.	4.9
Batch number: 183340705008A	Sample number(s): 9914792-9914800	
Manganese	N.D.	4.9
Batch number: 18332837106B	Sample number(s): 9914791-9914800	
Nitrate Nitrogen	N.D.	50
Sulfate	N.D.	300

### LCS/LCSD

Analysis Name	LCS Spike Added	LCS Conc	LCSD Spike Added	LCSD Conc	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
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\*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

## Quality Control Summary

Client Name: Chevron Environmental Mgmt Co  
Reported: 12/17/2018 17:08

Group Number: 2012877

### LCS/LCSD

Analysis Name	LCS Spike Added ug/l	LCS Conc ug/l	LCSD Spike Added ug/l	LCSD Conc ug/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: 18333WAE026	Sample number(s): 9914791-9914799								
Benzo(a)anthracene	1.00	0.967			97		67-111		
Benzo(a)pyrene	1.00	1.02			102		69-121		
Benzo(b)fluoranthene	1.00	1.00			100		70-123		
Benzo(k)fluoranthene	1.00	1.04			104		66-120		
Chrysene	1.00	0.998			100		66-109		
Dibenz(a,h)anthracene	1.00	0.958			96		55-123		
Indeno(1,2,3-cd)pyrene	1.00	1.00			100		52-124		
	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>					
Batch number: 18334A94A	Sample number(s): 9914792-9914801								
Benzene	20	20.88	20	20.88	104	104	80-120	0	30
NWTPH-Gx water C7-C12	1100	1371.44	1100	1372.98	125	125	64-131	0	30
Batch number: 18337A94A	Sample number(s): 9914791								
Benzene	20	20.61			103		80-120		
NWTPH-Gx water C7-C12	1100	1428.95			130		64-131		
	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>					
Batch number: 183330018A	Sample number(s): 9914792-9914800								
Methane	59.83	61.87			103		85-115		
Batch number: 183330019A	Sample number(s): 9914791								
Methane	59.83	64.63	59.83	65.12	108	109	85-115	1	20
	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>					
Batch number: 183380003A	Sample number(s): 9914791-9914799								
DX DRO C12-C24 w/ SiGel	600.14	221.55	600.14	247.15	37	41	10-115	11	20
	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>					
Batch number: 183340705005A	Sample number(s): 9914791								
Manganese	50	50.93			102		85-115		
Batch number: 183340705008A	Sample number(s): 9914792-9914800								
Manganese	50	57.22			114		85-115		
	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>					
Batch number: 18332837106B	Sample number(s): 9914791-9914800								
Nitrate Nitrogen	750	735.46			98		90-110		
Sulfate	7500	7535.63			100		90-110		

\*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

## Quality Control Summary

Client Name: Chevron Environmental Mgmt Co  
Reported: 12/17/2018 17:08

Group Number: 2012877

### MS/MSD

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc ug/l	MS Spike Added ug/l	MS Conc ug/l	MSD Spike Added ug/l	MSD Conc ug/l	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Batch number: 183340705005A Manganese	Sample number(s): 9914791 96.55	UNSPK: 9914791 50	152			111		70-130		
Batch number: 183340705008A Manganese	Sample number(s): 9914792-9914800 379.53	UNSPK: 9914792 50	435.84			113 (2)		70-130		
Batch number: 18332837106B Nitrate Nitrogen	Sample number(s): 9914791-9914800 N.D.	UNSPK: 9914792 2500	2454.18			98		90-110		
Sulfate	7438.17	25000	32402.78			100		90-110		

### Laboratory Duplicate

Background (BKG) = the sample used in conjunction with the duplicate

Analysis Name	BKG Conc ug/l	DUP Conc ug/l	DUP RPD	DUP RPD Max
Batch number: 183340705005A Manganese	Sample number(s): 9914791 96.55	BKG: 9914791 100.31	4	20
Batch number: 183340705008A Manganese	Sample number(s): 9914792-9914800 379.53	BKG: 9914792 387.98	2	20
Batch number: 18332837106B Nitrate Nitrogen	Sample number(s): 9914791-9914800 N.D.	BKG: 9914792 N.D.	0 (1)	15
Sulfate	7438.17	7703.05	3 (1)	15

### Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: SIM SVOAs 8270D MINI  
Batch number: 18333WAE026

	Fluoranthene-d10	Benzo(a)pyrene-d12	1-Methylnaphthalene-d10
9914791	116	37	73
9914792	105	72	68

\*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

## Quality Control Summary

Client Name: Chevron Environmental Mgmt Co  
Reported: 12/17/2018 17:08

Group Number: 2012877

### Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: SIM SVOAs 8270D MINI

Batch number: 18333WAE026

	Fluoranthene-d10	Benzo(a)pyrene-d12	1-Methylnaphthalene-d10
9914793	99	51	77
9914794	242*	57	54
9914795	85	70	81
9914796	89	72	78
9914797	91	70	76
9914798	89	72	76
9914799	89	72	75
Blank	88	85	76
LCS	92	83	71
Limits:	38-119	18-129	29-112

Analysis Name: Method 8021 Water Master

Batch number: 18334A94A

	Trifluorotoluene-P	Trifluorotoluene-F
9914792	82	74
9914793	81	84
9914794	79	74
9914795	80	72
9914796	81	73
9914797	81	73
9914798	81	76
9914799	81	76
9914800	81	88
9914801	81	75
Blank	81	72
LCS	80	96
LCSD	80	98
Limits:	51-120	50-150

Analysis Name: Method 8021 Water Master

Batch number: 18337A94A

	Trifluorotoluene-P	Trifluorotoluene-F
9914791	81	69
Blank	82	75
LCS	80	100
Limits:	51-120	50-150

Analysis Name: Volatile Headspace Hydrocarbon

Batch number: 183330018A

\*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

## Quality Control Summary

Client Name: Chevron Environmental Mgmt Co  
Reported: 12/17/2018 17:08

Group Number: 2012877

### Surrogate Quality Control (continued)

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: Volatile Headspace Hydrocarbon  
Batch number: 183330018A

	Propene
9914792	90
9914793	80
9914794	83
9914795	71
9914796	70
9914797	65
9914798	67
9914799	73
9914800	99
Blank	103
LCS	104

Limits: 46-135

Analysis Name: Volatile Headspace Hydrocarbon  
Batch number: 183330019A

	Propene
9914791	89
Blank	103
LCS	100
LCSD	101

Limits: 46-135

Analysis Name: NWTPH-Dx water w/Si Gel  
Batch number: 183380003A

	Orthoterphenyl	Capric Acid
9914791	63	0
9914792	80	0
9914793	28*	0
9914794	50	0
9914795	70	0
9914796	83	0
9914797	79	0
9914798	78	0
9914799	77	0
Blank	69	0
LCS	74	0
LCSD	76	0

Limits: 50-150      0-1

\*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

## Quality Control Summary

Client Name: Chevron Environmental Mgmt Co  
Reported: 12/17/2018 17:08

Group Number: 2012877

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\*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

# Chevron Northwest Region Analysis Request/Chain of Custody



**Lancaster Laboratories**

Acct. # 11964

For Lancaster Laboratories use only  
 Group # 2012877 Sample # 9914791-801

Instructions on reverse side correspond with circled numbers.

1 Client Information			4 Matrix			5 Analyses Requested										6 Remarks									
Facility # <u>Edmonds Terminal NWENVRM4001430802</u> WBS Site Address <u>11720 UNOLO Road, Edmonds, WA</u> Chevron PM <u>Kim Jolitz</u> Lead Consultant <u>Arcadis</u> Consultant/Office <u>1100 Olive Way, Suite 800, Seattle, WA 98101</u> Consultant Project Mgr. <u>Samuel Miles</u> Consultant Phone # _____			<input type="checkbox"/> Sediment <input checked="" type="checkbox"/> Potable Ground <input type="checkbox"/> Surface <input type="checkbox"/> NPDES <input type="checkbox"/> Air <input type="checkbox"/> Oil Total Number of Containers _____			<input type="checkbox"/> BTEX-MTBE <input checked="" type="checkbox"/> 80215 <input type="checkbox"/> 8260 <input type="checkbox"/> Naphth <input type="checkbox"/> 8260 full scan <input type="checkbox"/> Oxygenates <input type="checkbox"/> NWTPH GX <input checked="" type="checkbox"/> NWTPH DX <input type="checkbox"/> Silica Gel Cleanup <input type="checkbox"/> Lead <input type="checkbox"/> Total <input type="checkbox"/> Diss. <input type="checkbox"/> Method <input type="checkbox"/> WAVPH <input type="checkbox"/> WAEPH <input type="checkbox"/> CPAHs by USEPA 8270 SIM <input type="checkbox"/> Sulfate, Nitrate by USEPA 300.0 <input type="checkbox"/> Dissolved Methane USEPA RSK 175 <input type="checkbox"/> Dissolved Manganese USEPA 200.8										SCR #: _____ <input type="checkbox"/> Results in Dry Weight <input type="checkbox"/> J value reporting needed <input type="checkbox"/> Must meet lowest detection limits possible for 8260 compounds <input type="checkbox"/> 8021 MTBE Confirmation <input type="checkbox"/> Confirm MTBE + Naphthalene <input type="checkbox"/> Confirm highest hit by 8260 <input type="checkbox"/> Confirm all hits by 8260 <input type="checkbox"/> Run _____ oxy's on highest hit <input type="checkbox"/> Run _____ oxy's on all hits									
2 Sample Identification		3 Collected		Grab	Composite	Soil	Water	Oil	Total Number of Containers	BTEX-MTBE	8260 full scan	Oxygenates	NWTPH GX	NWTPH DX	Lead	Total	Diss.	Method	WAVPH	WAEPH	CPAHs by USEPA 8270 SIM	Sulfate, Nitrate by USEPA 300.0	Dissolved Methane USEPA RSK 175	Dissolved Manganese USEPA 200.8	Remarks
Date	Time	Date	Time																						
<u>LM-2</u>	<u>11/27/18</u>	<u>1425</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>				<u>11</u>	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	* Dissolved manganese was field filtered * use standard SGC
<u>MW-104</u>		<u>1115</u>	<input type="checkbox"/>	<input type="checkbox"/>				<u>11</u>	<input checked="" type="checkbox"/>				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
<u>MW-525</u>		<u>1035</u>	<input type="checkbox"/>	<input type="checkbox"/>				<u>11</u>	<input checked="" type="checkbox"/>				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
<u>MW-526</u>		<u>0900</u>	<input type="checkbox"/>	<input type="checkbox"/>				<u>11</u>	<input checked="" type="checkbox"/>				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
<u>MW-530</u>		<u>1340</u>	<input type="checkbox"/>	<input type="checkbox"/>				<u>11</u>	<input checked="" type="checkbox"/>				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
<u>MW-531</u>		<u>1025</u>	<input type="checkbox"/>	<input type="checkbox"/>				<u>11</u>	<input checked="" type="checkbox"/>				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
<u>MW-532</u>		<u>1030</u>	<input type="checkbox"/>	<input type="checkbox"/>				<u>11</u>	<input checked="" type="checkbox"/>				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
<u>MW-533</u>		<u>1130</u>	<input type="checkbox"/>	<input type="checkbox"/>				<u>11</u>	<input checked="" type="checkbox"/>				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
<u>MW-535</u>		<u>1120</u>	<input type="checkbox"/>	<input type="checkbox"/>				<u>11</u>	<input checked="" type="checkbox"/>				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
<u>MW-ER</u>		<u>1235</u>	<input type="checkbox"/>	<input type="checkbox"/>				<u>11</u>	<input checked="" type="checkbox"/>				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
<u>Trip Blank</u>			<input type="checkbox"/>	<input type="checkbox"/>				<u>11</u>	<input checked="" type="checkbox"/>				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
7 Turnaround Time Requested (TAT) (please circle) <input checked="" type="checkbox"/> Standard 5 day 4 day 72 hour 48 hour 24 hour			Relinquished by <u>[Signature]</u> Date <u>11/27/18</u> Time <u>1600</u>			Received by <u>FedEx</u> Date <u>11/27/18</u> Time <u>1600</u>			Relinquished by _____ Date _____ Time _____			Received by _____ Date _____ Time _____													
8 Data Package Options (please circle if required) Type I - Full Type VI (Raw Data)			Relinquished by Commercial Carrier: UPS _____ FedEx <input checked="" type="checkbox"/> Other _____			Received by <u>[Signature]</u> Date <u>11/28/18</u> Time <u>11:00</u>			Temperature Upon Receipt <u>1.0 / 0.9</u> °C			Custody Seals Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No													



Client: Chevron c/o Arcadis

**Delivery and Receipt Information**

Delivery Method: Fed Ex                      Arrival Timestamp: 11/28/2018 11:00  
 Number of Packages: 2                              Number of Projects: 1

**Arrival Condition Summary**

Shipping Container Sealed:	Yes	Sample IDs on COC match Containers:	Yes
Custody Seal Present:	Yes	Sample Date/Times match COC:	Yes
Custody Seal Intact:	Yes	VOA Vial Headspace $\geq$ 6mm:	No
Samples Chilled:	Yes	Total Trip Blank Qty:	1
Paperwork Enclosed:	Yes	Trip Blank Type:	HCI
Samples Intact:	Yes	Air Quality Samples Present:	No
Missing Samples:	No		
Extra Samples:	No		
Discrepancy in Container Qty on COC:	Yes		

*Unpacked by Nicole Reiff (25684) at 12:27 on 11/28/2018*

**Samples Chilled Details**

Thermometer Types:    *DT = Digital (Temp. Bottle)    IR = Infrared (Surface Temp)    All Temperatures in °C.*

Cooler #	Thermometer ID	Corrected Temp	Therm. Type	Ice Type	Ice Present?	Ice Container	Elevated Temp?
1	DT146	1.0	DT	Wet	Y	Bagged	N
2	DT146	0.9	DT	Wet	Y	Bagged	N

**Container Quantity Discrepancy Details**

Sample ID on COC	Container Qty. Received	Container Qty. on COC	Comments
MW-ER	7	11	



# Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

<b>BMQL</b>	Below Minimum Quantitation Level	<b>mL</b>	milliliter(s)
<b>C</b>	degrees Celsius	<b>MPN</b>	Most Probable Number
<b>cfu</b>	colony forming units	<b>N.D.</b>	non-detect
<b>CP Units</b>	cobalt-chloroplatinate units	<b>ng</b>	nanogram(s)
<b>F</b>	degrees Fahrenheit	<b>NTU</b>	nephelometric turbidity units
<b>g</b>	gram(s)	<b>pg/L</b>	picogram/liter
<b>IU</b>	International Units	<b>RL</b>	Reporting Limit
<b>kg</b>	kilogram(s)	<b>TNTC</b>	Too Numerous To Count
<b>L</b>	liter(s)	<b>µg</b>	microgram(s)
<b>lb.</b>	pound(s)	<b>µL</b>	microliter(s)
<b>m3</b>	cubic meter(s)	<b>umhos/cm</b>	micromhos/cm
<b>meq</b>	milliequivalents	<b>MCL</b>	Maximum Contamination Limit
<b>mg</b>	milligram(s)		
<b>&lt;</b>	less than		
<b>&gt;</b>	greater than		
<b>ppm</b>	parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.		
<b>ppb</b>	parts per billion		
<b>Dry weight basis</b>	Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.		

**Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.**

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

This report shall not be reproduced except in full, without the written approval of the laboratory.

Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as "analyze immediately" are not performed within 15 minutes.

**WARRANTY AND LIMITS OF LIABILITY** - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. THE FOREGOING EXPRESS WARRANTY IS EXCLUSIVE AND IS GIVEN IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. WE DISCLAIM ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING A WARRANTY OF FITNESS FOR PARTICULAR PURPOSE AND WARRANTY OF MERCHANTABILITY. IN NO EVENT SHALL EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL, LLC BE LIABLE FOR INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR LOSS OF PROFIT OR GOODWILL REGARDLESS OF (A) THE NEGLIGENCE (EITHER SOLE OR CONCURRENT) OF EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL AND (B) WHETHER EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL HAS BEEN INFORMED OF THE POSSIBILITY OF SUCH DAMAGES. We accept no legal responsibility for the purposes for which the client uses the test results. No purchase order or other order for work shall be accepted by Eurofins Lancaster Laboratories Environmental which includes any conditions that vary from the Standard Terms and Conditions, and Eurofins Lancaster Laboratories Environmental hereby objects to any conflicting terms contained in any acceptance or order submitted by client.

# Data Qualifiers

Qualifier	Definition
C	Result confirmed by reanalysis
D1	Indicates for dual column analyses that the result is reported from column 1
D2	Indicates for dual column analyses that the result is reported from column 2
E	Concentration exceeds the calibration range
K1	Initial Calibration Blank is above the QC limit and the sample result is ND
K2	Continuing Calibration Blank is above the QC limit and the sample result is ND
K3	Initial Calibration Verification is above the QC limit and the sample result is ND
K4	Continuing Calibration Verification is above the QC limit and the sample result is ND
J (or G, I, X)	Estimated value $\geq$ the Method Detection Limit (MDL or DL) and $<$ the Limit of Quantitation (LOQ or RL)
P	Concentration difference between the primary and confirmation column $>40\%$ . The lower result is reported.
P^	Concentration difference between the primary and confirmation column $> 40\%$ . The higher result is reported.
U	Analyte was not detected at the value indicated
V	Concentration difference between the primary and confirmation column $>100\%$ . The reporting limit is raised due to this disparity and evident interference.
W	The dissolved oxygen uptake for the unseeded blank is greater than 0.20 mg/L.
Z	Laboratory Defined - see analysis report

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods. Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.



## ANALYSIS REPORT

Prepared by:

Eurofins Lancaster Laboratories Environmental  
2425 New Holland Pike  
Lancaster, PA 17601

Prepared for:

Chevron Environmental Mgmt Co  
BR1 X5139C  
6101 Bollinger Canyon Road  
San Ramon CA 94583

Report Date: December 10, 2018 10:59

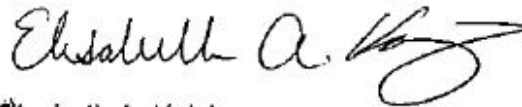
### Project: Edmonds Terminal

Account #: 11964  
Group Number: 2013349  
PO Number: 0015268291  
Release Number: JOLITZ  
State of Sample Origin: WA

Electronic Copy To Arcadis  
Electronic Copy To ARCADIS U.S., Inc.  
Electronic Copy To Arcadis  
Electronic Copy To Arcadis  
Electronic Copy To Arcadis  
Electronic Copy To Arcadis

Attn: Scott Zorn  
Attn: Sam Miles  
Attn: Jason Little  
Attn: Ryan Brauchla  
Attn: Ophelie Encelle  
Attn: Eric Krueger

Respectfully Submitted,



Elisabeth A. Knisley  
Project Manager

(717) 556-7262

To view our laboratory's current scopes of accreditation please go to <http://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster-laboratories-environmental/resources/certifications/>. Historical copies may be requested through your project manager.



## SAMPLE INFORMATION

<u>Client Sample Description</u>	<u>Sample Collection Date/Time</u>	<u>ELLE#</u>
MW-101-W-181128 Grab Groundwater	11/28/2018 12:45	9916719
MW-129R-W-181128 Grab Groundwater	11/28/2018 08:45	9916720
MW-139R-W-181128 Grab Groundwater	11/28/2018 11:50	9916721
MW-502-W-181128 Grab Groundwater	11/28/2018 11:30	9916722
MW-503-W-181128 Grab Groundwater	11/28/2018 09:55	9916723
MW-504-W-181128 Grab Groundwater	11/28/2018 10:10	9916724
MW-505-W-181128 Grab Groundwater	11/28/2018 11:06	9916725
MW-506-W-181128 Grab Groundwater	11/28/2018 10:30	9916726
MW-507-W-181128 Grab Groundwater	11/28/2018 08:35	9916727
MW-507-W-181128MS Grab Groundwater	11/28/2018 08:35	9916728
MW-507-W-181128MSD Grab Groundwater	11/28/2018 08:35	9916729
MW-507-W-181128DUP Grab Groundwater	11/28/2018 08:35	9916730
MW-509-W-181128 Grab Groundwater	11/28/2018 11:00	9916731
MW-515-W-181128 Grab Groundwater	11/28/2018 12:40	9916732
MW-518-W-181128 Grab Groundwater	11/28/2018 12:05	9916733
MW-534-W-181128 Grab Groundwater	11/28/2018 08:30	9916734
DUP-1-WD-181128 Grab Groundwater	11/28/2018	9916735
DUP-2-WD-181128 Grab Groundwater	11/28/2018	9916736
QA-T-181128 NA Water	11/28/2018	9916737
MW-ER-W-181128 Grab Groundwater	11/28/2018 12:35	9916738

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

**Sample Description:** MW-101-W-181128 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9916719  
**ELLE Group #:** 2013349  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 11/29/2018 10:30  
**Collection Date/Time:** 11/28/2018 12:45

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>					
<b>SW-846 8270D SIM</b>			<b>ug/l</b>	<b>ug/l</b>	
14244	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14244	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14244	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14244	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14244	Chrysene	218-01-9	N.D.	0.01	1
14244	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>					
<b>ECY 97-602 NWTPH-Gx</b>			<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	900	19	1
<b>GC Volatiles</b>					
<b>SW-846 8021B</b>			<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1
<b>GC Miscellaneous</b>					
<b>RSKSOP-175 modified</b>			<b>ug/l</b>	<b>ug/l</b>	
07105	Methane	74-82-8	4,100	60	20
<b>GC Petroleum Hydrocarbons w/Si</b>					
<b>ECY 97-602 NWTPH-Dx modified</b>			<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	45	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1
The reverse surrogate, capric acid, is present at <1%.					
<b>Metals Dissolved</b>					
<b>EPA 200.8 rev 5.4</b>			<b>ug/l</b>	<b>ug/l</b>	
06037	Manganese	7439-96-5	2,220	4.9	1
<b>Wet Chemistry</b>					
<b>EPA 300.0</b>			<b>ug/l</b>	<b>ug/l</b>	
00368	Nitrate Nitrogen	14797-55-8	N.D.	250	5
00228	Sulfate	14808-79-8	3,900	1,500	5

### Sample Comments

State of Washington Lab Certification No. C457  
This sample was field filtered for dissolved metals.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	18338WAF026	12/05/2018 13:20	Catherine E Bachman	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18338WAF026	12/04/2018 18:00	Mathias Okpo	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18334A94A	12/02/2018 00:34	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18334A94A	12/02/2018 00:34	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18334A94A	12/02/2018 00:33	Jeremy C Giffin	1
07105	Volatile Headspace Hydrocarbon	RSKSOP-175 modified	1	183340026A	12/01/2018 09:56	Johanna C Kennedy	20

**Sample Description:** MW-101-W-181128 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9916719  
**ELLE Group #:** 2013349  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submittal Date/Time:** 11/29/2018 10:30

**Collection Date/Time:** 11/28/2018 12:45

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	183380027A	12/07/2018 20:11	Thomas C Wildermuth	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	183380027A	12/04/2018 18:00	Mathias Okpo	1
06037	Manganese	EPA 200.8 rev 5.4	1	183340705010A	12/10/2018 05:30	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	183340705010	12/03/2018 04:33	James L Mertz	1
00368	Nitrate Nitrogen	EPA 300.0	1	18333520217A	11/30/2018 04:18	Samuel J Weaver	5
00228	Sulfate	EPA 300.0	1	18333520217A	11/30/2018 04:18	Samuel J Weaver	5

**Sample Description:** MW-129R-W-181128 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9916720  
**ELLE Group #:** 2013349  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 11/29/2018 10:30

**Collection Date/Time:** 11/28/2018 08:45

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270D SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14244	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14244	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14244	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14244	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14244	Chrysene	218-01-9	0.02	0.01	1
14244	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	32	19	1
<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1
<b>GC Miscellaneous</b>		<b>RSKSOP-175 modified</b>	<b>ug/l</b>	<b>ug/l</b>	
07105	Methane	74-82-8	1,800	30	10
<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	550	47	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	130	110	1
The reverse surrogate, capric acid, is present at <1%.					
<b>Metals Dissolved</b>		<b>EPA 200.8 rev 5.4</b>	<b>ug/l</b>	<b>ug/l</b>	
06037	Manganese	7439-96-5	7,670	4.9	1
<b>Wet Chemistry</b>		<b>EPA 300.0</b>	<b>ug/l</b>	<b>ug/l</b>	
00368	Nitrate Nitrogen	14797-55-8	N.D.	250	5
00228	Sulfate	14808-79-8	98,600	15,000	50

### Sample Comments

State of Washington Lab Certification No. C457  
This sample was field filtered for dissolved metals.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	18338WAF026	12/05/2018 13:49	Catherine E Bachman	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18338WAF026	12/04/2018 18:00	Mathias Okpo	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18334A94A	12/02/2018 01:51	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18334A94A	12/02/2018 01:51	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18334A94A	12/02/2018 01:50	Jeremy C Giffin	1
07105	Volatile Headspace Hydrocarbon	RSKSOP-175 modified	1	183340026A	12/01/2018 10:11	Johanna C Kennedy	10

**Sample Description:** MW-129R-W-181128 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9916720  
**ELLE Group #:** 2013349  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submittal Date/Time:** 11/29/2018 10:30

**Collection Date/Time:** 11/28/2018 08:45

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	183380027A	12/07/2018 20:34	Thomas C Wildermuth	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	183380027A	12/04/2018 18:00	Mathias Okpo	1
06037	Manganese	EPA 200.8 rev 5.4	1	183340705010A	12/10/2018 05:32	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	183340705010	12/03/2018 04:33	James L Mertz	1
00368	Nitrate Nitrogen	EPA 300.0	1	18333520117A	11/29/2018 21:11	Samuel J Weaver	5
00228	Sulfate	EPA 300.0	1	18333520117A	11/29/2018 21:28	Samuel J Weaver	50



**Sample Description:** MW-139R-W-181128 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9916721  
**ELLE Group #:** 2013349  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 11/29/2018 10:30  
**Collection Date/Time:** 11/28/2018 11:50

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>					
<b>SW-846 8270D SIM</b>			<b>ug/l</b>	<b>ug/l</b>	
14244	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14244	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14244	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14244	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14244	Chrysene	218-01-9	N.D.	0.01	1
14244	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>					
<b>ECY 97-602 NWTPH-Gx</b>			<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	19	1
<b>GC Volatiles</b>					
<b>SW-846 8021B</b>			<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1
<b>GC Miscellaneous</b>					
<b>RSKSOP-175 modified</b>			<b>ug/l</b>	<b>ug/l</b>	
07105	Methane	74-82-8	N.D.	3.0	1
<b>GC Petroleum Hydrocarbons w/Si</b>					
<b>ECY 97-602 NWTPH-Dx modified</b>			<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	47	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1
The reverse surrogate, capric acid, is present at <1%.					
<b>Metals Dissolved</b>					
<b>EPA 200.8 rev 5.4</b>			<b>ug/l</b>	<b>ug/l</b>	
06037	Manganese	7439-96-5	N.D.	4.9	1
<b>Wet Chemistry</b>					
<b>EPA 300.0</b>			<b>ug/l</b>	<b>ug/l</b>	
00368	Nitrate Nitrogen	14797-55-8	1,700	250	5
00228	Sulfate	14808-79-8	58,400	1,500	5

### Sample Comments

State of Washington Lab Certification No. C457  
This sample was field filtered for dissolved metals.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	18338WAF026	12/05/2018 14:19	Catherine E Bachman	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18338WAF026	12/04/2018 18:00	Mathias Okpo	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18334A94A	12/02/2018 02:17	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18334A94A	12/02/2018 02:17	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18334A94A	12/02/2018 02:16	Jeremy C Giffin	1
07105	Volatile Headspace Hydrocarbon	RSKSOP-175 modified	1	183340026A	11/30/2018 15:40	Johanna C Kennedy	1

**Sample Description:** MW-139R-W-181128 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9916721  
**ELLE Group #:** 2013349  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submittal Date/Time:** 11/29/2018 10:30

**Collection Date/Time:** 11/28/2018 11:50

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	183380027A	12/07/2018 20:58	Thomas C Wildermuth	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	183380027A	12/04/2018 18:00	Mathias Okpo	1
06037	Manganese	EPA 200.8 rev 5.4	1	183340705010A	12/10/2018 05:34	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	183340705010	12/03/2018 04:33	James L Mertz	1
00368	Nitrate Nitrogen	EPA 300.0	1	18333520117B	11/30/2018 02:35	Samuel J Weaver	5
00228	Sulfate	EPA 300.0	1	18333520117B	11/30/2018 02:35	Samuel J Weaver	5

**Sample Description:** MW-502-W-181128 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9916722  
**ELLE Group #:** 2013349  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 11/29/2018 10:30  
**Collection Date/Time:** 11/28/2018 11:30

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>					
<b>SW-846 8270D SIM</b>			<b>ug/l</b>	<b>ug/l</b>	
14244	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14244	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14244	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14244	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14244	Chrysene	218-01-9	N.D.	0.01	1
14244	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>					
<b>ECY 97-602 NWTPH-Gx</b>			<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	19	1
<b>GC Volatiles</b>					
<b>SW-846 8021B</b>			<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1
<b>GC Miscellaneous</b>					
<b>RSKSOP-175 modified</b>			<b>ug/l</b>	<b>ug/l</b>	
07105	Methane	74-82-8	N.D.	3.0	1
<b>GC Petroleum Hydrocarbons w/Si</b>					
<b>ECY 97-602 NWTPH-Dx modified</b>			<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	45	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1
The reverse surrogate, capric acid, is present at <1%.					
<b>Metals Dissolved</b>					
<b>EPA 200.8 rev 5.4</b>			<b>ug/l</b>	<b>ug/l</b>	
06037	Manganese	7439-96-5	208	4.9	1
<b>Wet Chemistry</b>					
<b>EPA 300.0</b>			<b>ug/l</b>	<b>ug/l</b>	
00368	Nitrate Nitrogen	14797-55-8	2,400	250	5
00228	Sulfate	14808-79-8	19,200	1,500	5

### Sample Comments

State of Washington Lab Certification No. C457  
This sample was field filtered for dissolved metals.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	18338WAF026	12/05/2018 14:48	Catherine E Bachman	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18338WAF026	12/04/2018 18:00	Mathias Okpo	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18334A94A	12/02/2018 02:42	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18334A94A	12/02/2018 02:42	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18334A94A	12/02/2018 02:41	Jeremy C Giffin	1
07105	Volatile Headspace Hydrocarbon	RSKSOP-175 modified	1	183340026A	11/30/2018 15:55	Johanna C Kennedy	1

**Sample Description:** MW-502-W-181128 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9916722  
**ELLE Group #:** 2013349  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submittal Date/Time:** 11/29/2018 10:30

**Collection Date/Time:** 11/28/2018 11:30

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	183380027A	12/07/2018 21:21	Thomas C Wildermuth	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	183380027A	12/04/2018 18:00	Mathias Okpo	1
06037	Manganese	EPA 200.8 rev 5.4	1	183340705010A	12/10/2018 05:41	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	183340705010	12/03/2018 04:33	James L Mertz	1
00368	Nitrate Nitrogen	EPA 300.0	1	18333520117B	11/30/2018 02:18	Samuel J Weaver	5
00228	Sulfate	EPA 300.0	1	18333520117B	11/30/2018 02:18	Samuel J Weaver	5

**Sample Description:** MW-503-W-181128 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9916723  
**ELLE Group #:** 2013349  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 11/29/2018 10:30

**Collection Date/Time:** 11/28/2018 09:55

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270D SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14244	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14244	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14244	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14244	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14244	Chrysene	218-01-9	N.D.	0.01	1
14244	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	19	1
<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1
<b>GC Miscellaneous</b>		<b>RSKSOP-175 modified</b>	<b>ug/l</b>	<b>ug/l</b>	
07105	Methane	74-82-8	95	3.0	1
<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	46	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1
The reverse surrogate, capric acid, is present at <1%.					
<b>Metals Dissolved</b>		<b>EPA 200.8 rev 5.4</b>	<b>ug/l</b>	<b>ug/l</b>	
06037	Manganese	7439-96-5	543	4.9	1
<b>Wet Chemistry</b>		<b>EPA 300.0</b>	<b>ug/l</b>	<b>ug/l</b>	
00368	Nitrate Nitrogen	14797-55-8	N.D.	250	5
00228	Sulfate	14808-79-8	31,900	1,500	5

### Sample Comments

State of Washington Lab Certification No. C457  
This sample was field filtered for dissolved metals.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	18338WAF026	12/05/2018 15:17	Catherine E Bachman	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18338WAF026	12/04/2018 18:00	Mathias Okpo	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18334A94A	12/02/2018 03:08	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18334A94A	12/02/2018 03:08	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18334A94A	12/02/2018 03:07	Jeremy C Giffin	1
07105	Volatile Headspace Hydrocarbon	RSKSOP-175 modified	1	183340026A	11/30/2018 16:10	Johanna C Kennedy	1

**Sample Description:** MW-503-W-181128 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9916723  
**ELLE Group #:** 2013349  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submittal Date/Time:** 11/29/2018 10:30

**Collection Date/Time:** 11/28/2018 09:55

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	183380027A	12/07/2018 21:44	Thomas C Wildermuth	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	183380027A	12/04/2018 18:00	Mathias Okpo	1
06037	Manganese	EPA 200.8 rev 5.4	1	183340705010A	12/10/2018 05:43	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	183340705010	12/03/2018 04:33	James L Mertz	1
00368	Nitrate Nitrogen	EPA 300.0	1	18333520117B	11/29/2018 23:27	Samuel J Weaver	5
00228	Sulfate	EPA 300.0	1	18333520117B	11/29/2018 23:27	Samuel J Weaver	5

**Sample Description:** MW-504-W-181128 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9916724  
**ELLE Group #:** 2013349  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 11/29/2018 10:30

**Collection Date/Time:** 11/28/2018 10:10

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270D SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14244	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14244	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14244	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14244	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14244	Chrysene	218-01-9	N.D.	0.01	1
14244	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1

The recovery for the sample internal standard is outside the QC acceptance limits. The following action was taken:

The sample was re-analyzed and internal standard areas are again outside of the QC acceptance limits, indicating a matrix effect.

The reported data is from the initial analysis of the sample.

<b>GC Volatiles</b>		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	19	1

<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1

<b>GC Miscellaneous</b>		<b>RSKSOP-175 modified</b>	<b>ug/l</b>	<b>ug/l</b>	
07105	Methane	74-82-8	15	3.0	1

<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	46	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1

The reverse surrogate, capric acid, is present at <1%.

<b>Metals Dissolved</b>		<b>EPA 200.8 rev 5.4</b>	<b>ug/l</b>	<b>ug/l</b>	
06037	Manganese	7439-96-5	443	4.9	1

<b>Wet Chemistry</b>		<b>EPA 300.0</b>	<b>ug/l</b>	<b>ug/l</b>	
00368	Nitrate Nitrogen	14797-55-8	750	250	5
00228	Sulfate	14808-79-8	39,000	1,500	5

### Sample Comments

State of Washington Lab Certification No. C457  
This sample was field filtered for dissolved metals.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	18338WAF026	12/05/2018 15:47	Catherine E Bachman	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18338WAF026	12/04/2018 18:00	Mathias Okpo	1

**Sample Description:** MW-504-W-181128 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9916724  
**ELLE Group #:** 2013349  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submittal Date/Time:** 11/29/2018 10:30

**Collection Date/Time:** 11/28/2018 10:10

## Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18334A94A	12/02/2018 03:34	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18334A94A	12/02/2018 03:34	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18334A94A	12/02/2018 03:33	Jeremy C Giffin	1
07105	Volatile Headspace Hydrocarbon	RSKSOP-175 modified	1	183340026A	11/30/2018 16:25	Johanna C Kennedy	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	183380027A	12/07/2018 22:08	Thomas C Wildermuth	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	183380027A	12/04/2018 18:00	Mathias Okpo	1
06037	Manganese	EPA 200.8 rev 5.4	1	183340705010A	12/10/2018 05:45	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	183340705010	12/03/2018 04:33	James L Mertz	1
00368	Nitrate Nitrogen	EPA 300.0	1	18333520117B	11/30/2018 00:19	Samuel J Weaver	5
00228	Sulfate	EPA 300.0	1	18333520117B	11/30/2018 00:19	Samuel J Weaver	5



**Sample Description:** MW-505-W-181128 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9916725  
**ELLE Group #:** 2013349  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 11/29/2018 10:30

**Collection Date/Time:** 11/28/2018 11:06

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>					
		<b>SW-846 8270D SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14244	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14244	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14244	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14244	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14244	Chrysene	218-01-9	N.D.	0.01	1
14244	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>					
		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	19	1
<b>GC Volatiles</b>					
		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1
<b>GC Miscellaneous</b>					
		<b>RSKSOP-175 modified</b>	<b>ug/l</b>	<b>ug/l</b>	
07105	Methane	74-82-8	480	15	5
<b>GC Petroleum Hydrocarbons w/Si</b>					
		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	48	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	110	1
<b>Metals Dissolved</b>					
		<b>EPA 200.8 rev 5.4</b>	<b>ug/l</b>	<b>ug/l</b>	
06037	Manganese	7439-96-5	1,520	4.9	1
<b>Wet Chemistry</b>					
		<b>EPA 300.0</b>	<b>ug/l</b>	<b>ug/l</b>	
00368	Nitrate Nitrogen	14797-55-8	N.D.	250	5
00228	Sulfate	14808-79-8	83,200	3,000	10

### Sample Comments

State of Washington Lab Certification No. C457  
This sample was field filtered for dissolved metals.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	18338WAF026	12/05/2018 18:56	Catherine E Bachman	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18338WAF026	12/04/2018 18:00	Mathias Okpo	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18334A94A	12/02/2018 04:00	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18334A94A	12/02/2018 04:00	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18334A94A	12/02/2018 03:59	Jeremy C Giffin	1
07105	Volatile Headspace Hydrocarbon	RSKSOP-175 modified	1	183340026A	12/01/2018 10:27	Johanna C Kennedy	5

**Sample Description:** MW-505-W-181128 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9916725  
**ELLE Group #:** 2013349  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submittal Date/Time:** 11/29/2018 10:30

**Collection Date/Time:** 11/28/2018 11:06

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	183340022A	12/03/2018 21:31	Thomas C Wildermuth	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	183340022A	12/02/2018 17:25	Christine E Gleim	1
06037	Manganese	EPA 200.8 rev 5.4	1	183340705010A	12/10/2018 05:47	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	183340705010	12/03/2018 04:33	James L Mertz	1
00368	Nitrate Nitrogen	EPA 300.0	1	18333520117B	11/30/2018 02:01	Samuel J Weaver	5
00228	Sulfate	EPA 300.0	1	18333520117B	12/04/2018 03:53	Clinton M Wilson	10

**Sample Description:** MW-506-W-181128 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9916726  
**ELLE Group #:** 2013349  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 11/29/2018 10:30  
**Collection Date/Time:** 11/28/2018 10:30

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270D SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14244	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14244	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14244	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14244	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14244	Chrysene	218-01-9	N.D.	0.01	1
14244	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	19	1
<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1
<b>GC Miscellaneous</b>		<b>RSKSOP-175 modified</b>	<b>ug/l</b>	<b>ug/l</b>	
07105	Methane	74-82-8	12,000	150	50
<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	46	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1
<b>Metals Dissolved</b>		<b>EPA 200.8 rev 5.4</b>	<b>ug/l</b>	<b>ug/l</b>	
06037	Manganese	7439-96-5	1,180	4.9	1
<b>Wet Chemistry</b>		<b>EPA 300.0</b>	<b>ug/l</b>	<b>ug/l</b>	
00368	Nitrate Nitrogen	14797-55-8	N.D.	250	5
00228	Sulfate	14808-79-8	19,800	1,500	5

### Sample Comments

State of Washington Lab Certification No. C457  
This sample was field filtered for dissolved metals.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	18338WAF026	12/05/2018 19:25	Catherine E Bachman	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18338WAF026	12/04/2018 18:00	Mathias Okpo	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18337A94A	12/04/2018 03:11	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18337A94A	12/04/2018 03:11	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18337A94A	12/04/2018 03:10	Jeremy C Giffin	1
07105	Volatile Headspace Hydrocarbon	RSKSOP-175 modified	1	183340026A	12/01/2018 10:42	Johanna C Kennedy	50

**Sample Description:** MW-506-W-181128 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9916726  
**ELLE Group #:** 2013349  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submittal Date/Time:** 11/29/2018 10:30

**Collection Date/Time:** 11/28/2018 10:30

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	183340022A	12/03/2018 21:59	Thomas C Wildermuth	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	183340022A	12/02/2018 17:25	Christine E Gleim	1
06037	Manganese	EPA 200.8 rev 5.4	1	183340705010A	12/10/2018 05:49	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	183340705010	12/03/2018 04:33	James L Mertz	1
00368	Nitrate Nitrogen	EPA 300.0	1	18333520117B	11/30/2018 00:36	Samuel J Weaver	5
00228	Sulfate	EPA 300.0	1	18333520117B	11/30/2018 00:36	Samuel J Weaver	5

**Sample Description:** MW-507-W-181128 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9916727  
**ELLE Group #:** 2013349  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 11/29/2018 10:30

**Collection Date/Time:** 11/28/2018 08:35

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>					
<b>SW-846 8270D SIM</b>			<b>ug/l</b>	<b>ug/l</b>	
14244	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14244	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14244	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14244	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14244	Chrysene	218-01-9	N.D.	0.01	1
14244	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>					
<b>ECY 97-602 NWTPH-Gx</b>			<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	19	1
<b>GC Volatiles</b>					
<b>SW-846 8021B</b>			<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1
<b>GC Miscellaneous</b>					
<b>RSKSOP-175 modified</b>			<b>ug/l</b>	<b>ug/l</b>	
07105	Methane	74-82-8	3.9	3.0	1
<b>GC Petroleum Hydrocarbons w/Si</b>					
<b>ECY 97-602 NWTPH-Dx modified</b>			<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	45	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1
<b>Metals Dissolved</b>					
<b>EPA 200.8 rev 5.4</b>			<b>ug/l</b>	<b>ug/l</b>	
06037	Manganese	7439-96-5	83.5	4.9	1
<b>Wet Chemistry</b>					
<b>EPA 300.0</b>			<b>ug/l</b>	<b>ug/l</b>	
00368	Nitrate Nitrogen	14797-55-8	2,400	250	5
00228	Sulfate	14808-79-8	144,000	6,000	20

### Sample Comments

State of Washington Lab Certification No. C457  
This sample was field filtered for dissolved metals.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	18338WAF026	12/05/2018 11:51	Catherine E Bachman	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18338WAF026	12/04/2018 18:00	Mathias Okpo	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18337A94A	12/04/2018 00:11	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18337A94A	12/04/2018 00:11	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18337A94A	12/04/2018 00:10	Jeremy C Giffin	1
07105	Volatile Headspace Hydrocarbon	RSKSOP-175 modified	1	183340026A	11/30/2018 17:26	Johanna C Kennedy	1

**Sample Description:** MW-507-W-181128 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9916727  
**ELLE Group #:** 2013349  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submittal Date/Time:** 11/29/2018 10:30

**Collection Date/Time:** 11/28/2018 08:35

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	183340022A	12/03/2018 22:22	Thomas C Wildermuth	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	183340022A	12/02/2018 17:25	Christine E Gleim	1
06037	Manganese	EPA 200.8 rev 5.4	1	183340705010A	12/10/2018 05:19	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	183340705010	12/03/2018 04:33	James L Mertz	1
00368	Nitrate Nitrogen	EPA 300.0	1	18333520117B	11/29/2018 22:36	Samuel J Weaver	5
00228	Sulfate	EPA 300.0	1	18333520117B	12/04/2018 02:21	Clinton M Wilson	20

**Sample Description:** MW-507-W-181128MS Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9916728  
**ELLE Group #:** 2013349  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 11/29/2018 10:30

**Collection Date/Time:** 11/28/2018 08:35

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>					
		<b>SW-846 8270D SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14244	Benzo(a)anthracene	56-55-3	1	0.01	1
14244	Benzo(a)pyrene	50-32-8	1	0.01	1
14244	Benzo(b)fluoranthene	205-99-2	1	0.01	1
14244	Benzo(k)fluoranthene	207-08-9	1	0.01	1
14244	Chrysene	218-01-9	1	0.01	1
14244	Dibenz(a,h)anthracene	53-70-3	0.9	0.02	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	1	0.01	1
<b>GC Volatiles</b>					
		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	1,500	19	1
<b>GC Volatiles</b>					
		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	21	0.5	1
<b>GC Miscellaneous</b>					
		<b>RSKSOP-175 modified</b>	<b>ug/l</b>	<b>ug/l</b>	
07105	Methane	74-82-8	50	3.0	1
<b>GC Petroleum Hydrocarbons w/Si</b>					
		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	220	46	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1
<b>Metals Dissolved</b>					
		<b>EPA 200.8 rev 5.4</b>	<b>ug/l</b>	<b>ug/l</b>	
06037	Manganese	7439-96-5	156	4.9	1
<b>Wet Chemistry</b>					
		<b>EPA 300.0</b>	<b>ug/l</b>	<b>ug/l</b>	
00368	Nitrate Nitrogen	14797-55-8	4,700	250	5
00228	Sulfate	14808-79-8	248,000	6,000	20

### Sample Comments

State of Washington Lab Certification No. C457  
This sample was field filtered for dissolved metals.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	18338WAF026	12/05/2018 12:21	Catherine E Bachman	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18338WAF026	12/04/2018 18:00	Mathias Okpo	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18337A94A	12/04/2018 02:20	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18337A94A	12/04/2018 01:28	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18337A94A	12/04/2018 01:27	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	2	18337A94A	12/04/2018 02:19	Jeremy C Giffin	1
07105	Volatile Headspace Hydrocarbon	RSKSOP-175 modified	1	183340026A	11/30/2018 17:42	Johanna C Kennedy	1

**Sample Description:** MW-507-W-181128MS Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9916728  
**ELLE Group #:** 2013349  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submittal Date/Time:** 11/29/2018 10:30

**Collection Date/Time:** 11/28/2018 08:35

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	183340022A	12/03/2018 22:45	Thomas C Wildermuth	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	183340022A	12/02/2018 17:25	Christine E Gleim	1
06037	Manganese	EPA 200.8 rev 5.4	1	183340705010A	12/10/2018 05:26	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	183340705010	12/03/2018 04:33	James L Mertz	1
00368	Nitrate Nitrogen	EPA 300.0	1	18333520117B	11/29/2018 23:10	Samuel J Weaver	5
00228	Sulfate	EPA 300.0	1	18333520117B	12/04/2018 02:58	Clinton M Wilson	20



**Sample Description:** MW-507-W-181128MSD Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9916729  
**ELLE Group #:** 2013349  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 11/29/2018 10:30

**Collection Date/Time:** 11/28/2018 08:35

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>					
		<b>SW-846 8270D SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14244	Benzo(a)anthracene	56-55-3	1	0.01	1
14244	Benzo(a)pyrene	50-32-8	1	0.01	1
14244	Benzo(b)fluoranthene	205-99-2	0.9	0.01	1
14244	Benzo(k)fluoranthene	207-08-9	1	0.01	1
14244	Chrysene	218-01-9	1	0.01	1
14244	Dibenz(a,h)anthracene	53-70-3	0.9	0.02	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	1	0.01	1
<b>GC Volatiles</b>					
		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	1,500	19	1
<b>GC Volatiles</b>					
		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	23	0.5	1
<b>GC Miscellaneous</b>					
		<b>RSKSOP-175 modified</b>	<b>ug/l</b>	<b>ug/l</b>	
07105	Methane	74-82-8	44	3.0	1
<b>GC Petroleum Hydrocarbons w/Si</b>					
		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	190	46	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1

### Sample Comments

State of Washington Lab Certification No. C457  
This sample was field filtered for dissolved metals.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	18338WAF026	12/05/2018 12:50	Catherine E Bachman	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18338WAF026	12/04/2018 18:00	Mathias Okpo	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18337A94A	12/04/2018 02:45	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18337A94A	12/04/2018 01:54	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18337A94A	12/04/2018 01:53	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	2	18337A94A	12/04/2018 02:44	Jeremy C Giffin	1
07105	Volatile Headspace Hydrocarbon	RSKSOP-175 modified	1	183340026A	11/30/2018 17:57	Johanna C Kennedy	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	183340022A	12/03/2018 23:09	Thomas C Wildermuth	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	183340022A	12/02/2018 17:25	Christine E Gleim	1

**Sample Description:** MW-507-W-181128DUP Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9916730  
**ELLE Group #:** 2013349  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 11/29/2018 10:30  
**Collection Date/Time:** 11/28/2018 08:35

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>Metals Dissolved</b>		<b>EPA 200.8 rev 5.4</b>	<b>ug/l</b>	<b>ug/l</b>	
06037	Manganese	7439-96-5	84.7	4.9	1
<b>Wet Chemistry</b>		<b>EPA 300.0</b>	<b>ug/l</b>	<b>ug/l</b>	
00368	Nitrate Nitrogen	14797-55-8	2,400	250	5
00228	Sulfate	14808-79-8	147,000	6,000	20

### Sample Comments

State of Washington Lab Certification No. C457  
This sample was field filtered for dissolved metals.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06037	Manganese	EPA 200.8 rev 5.4	1	183340705010A	12/10/2018 05:24	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	183340705010	12/03/2018 04:33	James L Mertz	1
00368	Nitrate Nitrogen	EPA 300.0	1	18333520117B	11/29/2018 22:53	Samuel J Weaver	5
00228	Sulfate	EPA 300.0	1	18333520117B	12/04/2018 02:40	Clinton M Wilson	20

**Sample Description:** MW-509-W-181128 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9916731  
**ELLE Group #:** 2013349  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 11/29/2018 10:30  
**Collection Date/Time:** 11/28/2018 11:00

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>					
		<b>SW-846 8270D SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14244	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14244	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14244	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14244	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14244	Chrysene	218-01-9	N.D.	0.01	1
14244	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>					
		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	19	1
<b>GC Volatiles</b>					
		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1
<b>GC Miscellaneous</b>					
		<b>RSKSOP-175 modified</b>	<b>ug/l</b>	<b>ug/l</b>	
07105	Methane	74-82-8	50	3.0	1
<b>GC Petroleum Hydrocarbons w/Si</b>					
		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	46	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1
<b>Metals Dissolved</b>					
		<b>EPA 200.8 rev 5.4</b>	<b>ug/l</b>	<b>ug/l</b>	
06037	Manganese	7439-96-5	57.0	4.9	1
<b>Wet Chemistry</b>					
		<b>EPA 300.0</b>	<b>ug/l</b>	<b>ug/l</b>	
00368	Nitrate Nitrogen	14797-55-8	1,400	250	5
00228	Sulfate	14808-79-8	193,000	6,000	20

### Sample Comments

State of Washington Lab Certification No. C457  
This sample was field filtered for dissolved metals.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	18338WAF026	12/05/2018 19:55	Catherine E Bachman	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18338WAF026	12/04/2018 18:00	Mathias Okpo	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18337A94A	12/03/2018 21:38	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18337A94A	12/03/2018 21:38	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18337A94A	12/03/2018 21:37	Jeremy C Giffin	1
07105	Volatile Headspace Hydrocarbon	RSKSOP-175 modified	1	183340026A	11/30/2018 18:12	Johanna C Kennedy	1

**Sample Description:** MW-509-W-181128 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9916731  
**ELLE Group #:** 2013349  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submittal Date/Time:** 11/29/2018 10:30

**Collection Date/Time:** 11/28/2018 11:00

## Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	183340022A	12/04/2018 00:19	Thomas C Wildermuth	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	183340022A	12/02/2018 17:25	Christine E Gleim	1
06037	Manganese	EPA 200.8 rev 5.4	1	183340705010A	12/10/2018 05:51	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	183340705010	12/03/2018 04:33	James L Mertz	1
00368	Nitrate Nitrogen	EPA 300.0	1	18333520117B	11/30/2018 00:53	Samuel J Weaver	5
00228	Sulfate	EPA 300.0	1	18333520117B	12/04/2018 03:16	Clinton M Wilson	20

**Sample Description:** MW-515-W-181128 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9916732  
**ELLE Group #:** 2013349  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 11/29/2018 10:30  
**Collection Date/Time:** 11/28/2018 12:40

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270D SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14244	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14244	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14244	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14244	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14244	Chrysene	218-01-9	N.D.	0.01	1
14244	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	19	1
<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1
<b>GC Miscellaneous</b>		<b>RSKSOP-175 modified</b>	<b>ug/l</b>	<b>ug/l</b>	
07105	Methane	74-82-8	4.3	3.0	1
<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	48	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	110	1
<b>Metals Dissolved</b>		<b>EPA 200.8 rev 5.4</b>	<b>ug/l</b>	<b>ug/l</b>	
06037	Manganese	7439-96-5	87.3	4.9	1
<b>Wet Chemistry</b>		<b>EPA 300.0</b>	<b>ug/l</b>	<b>ug/l</b>	
00368	Nitrate Nitrogen	14797-55-8	600	250	5
00228	Sulfate	14808-79-8	37,900	1,500	5

### Sample Comments

State of Washington Lab Certification No. C457  
This sample was field filtered for dissolved metals.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	18338WAF026	12/05/2018 20:24	Catherine E Bachman	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18338WAF026	12/04/2018 18:00	Mathias Okpo	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18337A94A	12/03/2018 22:03	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18337A94A	12/03/2018 22:03	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18337A94A	12/03/2018 22:02	Jeremy C Giffin	1
07105	Volatile Headspace Hydrocarbon	RSKSOP-175 modified	1	183340026A	11/30/2018 18:28	Johanna C Kennedy	1

**Sample Description:** MW-515-W-181128 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9916732  
**ELLE Group #:** 2013349  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submittal Date/Time:** 11/29/2018 10:30

**Collection Date/Time:** 11/28/2018 12:40

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	183340022A	12/04/2018 00:43	Thomas C Wildermuth	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	183340022A	12/02/2018 17:25	Christine E Gleim	1
06037	Manganese	EPA 200.8 rev 5.4	1	183340705011A	12/09/2018 05:42	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	183340705011	12/03/2018 04:33	James L Mertz	1
00368	Nitrate Nitrogen	EPA 300.0	1	18333520217A	11/30/2018 04:01	Samuel J Weaver	5
00228	Sulfate	EPA 300.0	1	18333520217A	11/30/2018 04:01	Samuel J Weaver	5

**Sample Description:** MW-518-W-181128 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9916733  
**ELLE Group #:** 2013349  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 11/29/2018 10:30

**Collection Date/Time:** 11/28/2018 12:05

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270D SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14244	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14244	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14244	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14244	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14244	Chrysene	218-01-9	N.D.	0.01	1
14244	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	840	19	1
<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1
<b>GC Miscellaneous</b>		<b>RSKSOP-175 modified</b>	<b>ug/l</b>	<b>ug/l</b>	
07105	Methane	74-82-8	2,300	30	10
<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	47	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	110	1
<b>Metals Dissolved</b>		<b>EPA 200.8 rev 5.4</b>	<b>ug/l</b>	<b>ug/l</b>	
06037	Manganese	7439-96-5	867	4.9	1
<b>Wet Chemistry</b>		<b>EPA 300.0</b>	<b>ug/l</b>	<b>ug/l</b>	
00368	Nitrate Nitrogen	14797-55-8	N.D.	250	5
00228	Sulfate	14808-79-8	7,500	1,500	5

### Sample Comments

State of Washington Lab Certification No. C457  
This sample was field filtered for dissolved metals.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	18338WAF026	12/05/2018 20:54	Catherine E Bachman	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18338WAF026	12/04/2018 18:00	Mathias Okpo	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18337A94A	12/03/2018 22:29	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18337A94A	12/03/2018 22:29	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18337A94A	12/03/2018 22:28	Jeremy C Giffin	1
07105	Volatile Headspace Hydrocarbon	RSKSOP-175 modified	1	183340026A	12/01/2018 10:57	Johanna C Kennedy	10

**Sample Description:** MW-518-W-181128 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9916733  
**ELLE Group #:** 2013349  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submittal Date/Time:** 11/29/2018 10:30

**Collection Date/Time:** 11/28/2018 12:05

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	183340022A	12/04/2018 01:06	Thomas C Wildermuth	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	183340022A	12/02/2018 17:25	Christine E Gleim	1
06037	Manganese	EPA 200.8 rev 5.4	1	183340705011A	12/09/2018 06:08	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	183340705011	12/03/2018 04:33	James L Mertz	1
00368	Nitrate Nitrogen	EPA 300.0	1	18333520217A	11/30/2018 02:52	Samuel J Weaver	5
00228	Sulfate	EPA 300.0	1	18333520217A	11/30/2018 02:52	Samuel J Weaver	5



**Sample Description:** MW-534-W-181128 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9916734  
**ELLE Group #:** 2013349  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 11/29/2018 10:30

**Collection Date/Time:** 11/28/2018 08:30

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>					
		<b>SW-846 8270D SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14244	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14244	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14244	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14244	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14244	Chrysene	218-01-9	N.D.	0.01	1
14244	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>					
		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	19	1
<b>GC Volatiles</b>					
		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1
<b>GC Miscellaneous</b>					
		<b>RSKSOP-175 modified</b>	<b>ug/l</b>	<b>ug/l</b>	
07105	Methane	74-82-8	140	3.0	1
<b>GC Petroleum Hydrocarbons w/Si</b>					
		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	46	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1
<b>Metals Dissolved</b>					
		<b>EPA 200.8 rev 5.4</b>	<b>ug/l</b>	<b>ug/l</b>	
06037	Manganese	7439-96-5	209	4.9	1
<b>Wet Chemistry</b>					
		<b>EPA 300.0</b>	<b>ug/l</b>	<b>ug/l</b>	
00368	Nitrate Nitrogen	14797-55-8	N.D.	250	5
00228	Sulfate	14808-79-8	32,500	1,500	5

### Sample Comments

State of Washington Lab Certification No. C457  
This sample was field filtered for dissolved metals.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	18338WAF026	12/05/2018 21:23	Catherine E Bachman	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18338WAF026	12/04/2018 18:00	Mathias Okpo	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18337A94A	12/03/2018 22:54	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18337A94A	12/03/2018 22:54	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18337A94A	12/03/2018 22:53	Jeremy C Giffin	1
07105	Volatile Headspace Hydrocarbon	RSKSOP-175 modified	1	183340026A	11/30/2018 18:58	Johanna C Kennedy	1

**Sample Description:** MW-534-W-181128 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9916734  
**ELLE Group #:** 2013349  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submittal Date/Time:** 11/29/2018 10:30

**Collection Date/Time:** 11/28/2018 08:30

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	183340022A	12/04/2018 01:30	Thomas C Wildermuth	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	183340022A	12/02/2018 17:25	Christine E Gleim	1
06037	Manganese	EPA 200.8 rev 5.4	1	183340705011A	12/09/2018 06:10	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	183340705011	12/03/2018 04:33	James L Mertz	1
00368	Nitrate Nitrogen	EPA 300.0	1	18333520117A	11/29/2018 20:54	Samuel J Weaver	5
00228	Sulfate	EPA 300.0	1	18333520117A	11/29/2018 20:54	Samuel J Weaver	5

**Sample Description:** DUP-1-WD-181128 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9916735  
**ELLE Group #:** 2013349  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 11/29/2018 10:30  
**Collection Date/Time:** 11/28/2018

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270D SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14244	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14244	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14244	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14244	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14244	Chrysene	218-01-9	N.D.	0.01	1
14244	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	19	1
<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1
<b>GC Miscellaneous</b>		<b>RSKSOP-175 modified</b>	<b>ug/l</b>	<b>ug/l</b>	
07105	Methane	74-82-8	200	3.0	1
<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	46	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1
<b>Metals Dissolved</b>		<b>EPA 200.8 rev 5.4</b>	<b>ug/l</b>	<b>ug/l</b>	
06037	Manganese	7439-96-5	226	4.9	1
<b>Wet Chemistry</b>		<b>EPA 300.0</b>	<b>ug/l</b>	<b>ug/l</b>	
00368	Nitrate Nitrogen	14797-55-8	N.D.	250	5
00228	Sulfate	14808-79-8	35,400	1,500	5

### Sample Comments

State of Washington Lab Certification No. C457  
This sample was field filtered for dissolved metals.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	18338WAF026	12/05/2018 21:53	Catherine E Bachman	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18338WAF026	12/04/2018 18:00	Mathias Okpo	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18337A94A	12/03/2018 23:20	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18337A94A	12/03/2018 23:20	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18337A94A	12/03/2018 23:19	Jeremy C Giffin	1
07105	Volatile Headspace Hydrocarbon	RSKSOP-175 modified	1	183340026A	11/30/2018 19:14	Johanna C Kennedy	1

**Sample Description:** DUP-1-WD-181128 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9916735  
**ELLE Group #:** 2013349  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submittal Date/Time:** 11/29/2018 10:30

**Collection Date/Time:** 11/28/2018

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	183340022A	12/04/2018 01:53	Thomas C Wildermuth	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	183340022A	12/02/2018 17:25	Christine E Gleim	1
06037	Manganese	EPA 200.8 rev 5.4	1	183340705011A	12/09/2018 06:13	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	183340705011	12/03/2018 04:33	James L Mertz	1
00368	Nitrate Nitrogen	EPA 300.0	1	18333520206B	11/29/2018 16:32	Ashlynn M Cornelius	5
00228	Sulfate	EPA 300.0	1	18333520206B	11/30/2018 21:26	Ashlynn M Cornelius	5

**Sample Description:** DUP-2-WD-181128 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9916736  
**ELLE Group #:** 2013349  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 11/29/2018 10:30  
**Collection Date/Time:** 11/28/2018

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>					
		<b>SW-846 8270D SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14244	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14244	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14244	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14244	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14244	Chrysene	218-01-9	N.D.	0.01	1
14244	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>					
		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	19	1
<b>GC Volatiles</b>					
		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1
<b>GC Miscellaneous</b>					
		<b>RSKSOP-175 modified</b>	<b>ug/l</b>	<b>ug/l</b>	
07105	Methane	74-82-8	6.3	3.0	1
<b>GC Petroleum Hydrocarbons w/Si</b>					
		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	50	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	110	1
<b>Metals Dissolved</b>					
		<b>EPA 200.8 rev 5.4</b>	<b>ug/l</b>	<b>ug/l</b>	
06037	Manganese	7439-96-5	80.8	4.9	1
<b>Wet Chemistry</b>					
		<b>EPA 300.0</b>	<b>ug/l</b>	<b>ug/l</b>	
00368	Nitrate Nitrogen	14797-55-8	660	250	5
00228	Sulfate	14808-79-8	40,000	1,500	5

### Sample Comments

State of Washington Lab Certification No. C457  
This sample was field filtered for dissolved metals.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	18338WAF026	12/05/2018 22:22	Catherine E Bachman	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18338WAF026	12/04/2018 18:00	Mathias Okpo	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18337A94A	12/03/2018 23:46	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18337A94A	12/03/2018 23:46	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18337A94A	12/03/2018 23:45	Jeremy C Giffin	1
07105	Volatile Headspace Hydrocarbon	RSKSOP-175 modified	1	183340026A	11/30/2018 19:44	Johanna C Kennedy	1

**Sample Description:** DUP-2-WD-181128 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9916736  
**ELLE Group #:** 2013349  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submittal Date/Time:** 11/29/2018 10:30

**Collection Date/Time:** 11/28/2018

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	183340022A	12/04/2018 02:16	Thomas C Wildermuth	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	183340022A	12/02/2018 17:25	Christine E Gleim	1
06037	Manganese	EPA 200.8 rev 5.4	1	183340705011A	12/09/2018 06:15	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	183340705011	12/03/2018 04:33	James L Mertz	1
00368	Nitrate Nitrogen	EPA 300.0	1	18333520206B	11/29/2018 16:50	Ashlynn M Cornelius	5
00228	Sulfate	EPA 300.0	1	18333520206B	11/30/2018 21:45	Ashlynn M Cornelius	5

**Sample Description:** QA-T-181128 NA Water  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
ELLE Sample #: WW 9916737  
ELLE Group #: 2013349  
Matrix: Water

**Project Name:** Edmonds Terminal

Submittal Date/Time: 11/29/2018 10:30  
Collection Date/Time: 11/28/2018

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC Volatiles</b>					
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx n.a.	ug/l N.D.	ug/l 19	1
<b>GC Volatiles</b>					
02102	Benzene	SW-846 8021B 71-43-2	ug/l N.D.	ug/l 0.5	1

### Sample Comments

State of Washington Lab Certification No. C457

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18337A94A	12/03/2018 21:12	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18337A94A	12/03/2018 21:12	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18337A94A	12/03/2018 21:11	Jeremy C Giffin	1

**Sample Description:** MW-ER-W-181128 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9916738  
**ELLE Group #:** 2013349  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submittal Date/Time:** 11/29/2018 10:30  
**Collection Date/Time:** 11/28/2018 12:35

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270D SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14244	Benzo(a)anthracene	56-55-3	0.03	0.01	1
14244	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14244	Benzo(b)fluoranthene	205-99-2	0.01	0.01	1
14244	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14244	Chrysene	218-01-9	0.08	0.01	1
14244	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
The surrogate data is outside the QC limits due to unresolvable matrix problems evident in the sample chromatogram.					
<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWTPh-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	640	48	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	110	1

### Sample Comments

State of Washington Lab Certification No. C457

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	18338WAF026	12/05/2018 22:51	Catherine E Bachman	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18338WAF026	12/04/2018 18:00	Mathias Okpo	1
12917	NWTPh-Dx water w/Si Gel	ECY 97-602 NWTPh-Dx modified	1	183340022A	12/04/2018 02:40	Thomas C Wildermuth	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPh-Dx 06/97	1	183340022A	12/02/2018 17:25	Christine E Gleim	1



## Quality Control Summary

Client Name: Chevron Environmental Mgmt Co  
Reported: 12/10/2018 10:59

Group Number: 2013349

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

### Method Blank

Analysis Name	Result	MDL
	ug/l	ug/l
Batch number: 18338WAF026	Sample number(s): 9916719-9916729,9916731-9916736,9916738	
Benzo(a)anthracene	N.D.	0.01
Benzo(a)pyrene	N.D.	0.01
Benzo(b)fluoranthene	N.D.	0.01
Benzo(k)fluoranthene	N.D.	0.01
Chrysene	N.D.	0.01
Dibenz(a,h)anthracene	N.D.	0.02
Indeno(1,2,3-cd)pyrene	N.D.	0.01
Batch number: 18334A94A	Sample number(s): 9916719-9916725	
Benzene	N.D.	0.03
NWTPH-Gx water C7-C12	N.D.	19
Batch number: 18337A94A	Sample number(s): 9916726-9916729,9916731-9916737	
Benzene	N.D.	0.03
NWTPH-Gx water C7-C12	N.D.	19
Batch number: 183340026A	Sample number(s): 9916719-9916729,9916731-9916736	
Methane	N.D.	3.0
Batch number: 183340022A	Sample number(s): 9916725-9916729,9916731-9916736,9916738	
DX DRO C12-C24 w/ SiGel	N.D.	45
DX HRO C24-C40 w/ SiGel	N.D.	100
Batch number: 183380027A	Sample number(s): 9916719-9916724	
DX DRO C12-C24 w/ SiGel	N.D.	45
DX HRO C24-C40 w/ SiGel	N.D.	100
Batch number: 183340705010A	Sample number(s): 9916719-9916728,9916730-9916731	
Manganese	N.D.	4.9
Batch number: 183340705011A	Sample number(s): 9916732-9916736	
Manganese	N.D.	4.9
Batch number: 18333520117A	Sample number(s): 9916720,9916734	
Nitrate Nitrogen	N.D.	50
Sulfate	N.D.	300
Batch number: 18333520117B	Sample number(s): 9916721-9916728,9916730-9916731	
Nitrate Nitrogen	N.D.	50
Sulfate	N.D.	300
Batch number: 18333520206B	Sample number(s): 9916735-9916736	
Nitrate Nitrogen	N.D.	50

\*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

## Quality Control Summary

Client Name: Chevron Environmental Mgmt Co  
Reported: 12/10/2018 10:59

Group Number: 2013349

### Method Blank (continued)

Analysis Name	Result	MDL
	ug/l	ug/l
Sulfate	N.D.	300
Batch number: 18333520217A	Sample number(s): 9916719,9916732-9916733	
Nitrate Nitrogen	N.D.	50
Sulfate	N.D.	300

### LCS/LCSD

Analysis Name	LCS Spike Added	LCS Conc	LCSD Spike Added	LCSD Conc	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
	ug/l	ug/l	ug/l	ug/l					
Batch number: 18338WAF026	Sample number(s): 9916719-9916729,9916731-9916736,9916738								
Benzo(a)anthracene	1.00	0.798			80		67-111		
Benzo(a)pyrene	1.00	0.906			91		69-121		
Benzo(b)fluoranthene	1.00	0.881			88		70-123		
Benzo(k)fluoranthene	1.00	0.957			96		66-120		
Chrysene	1.00	0.930			93		66-109		
Dibenz(a,h)anthracene	1.00	0.849			85		55-123		
Indeno(1,2,3-cd)pyrene	1.00	0.832			83		52-124		
	ug/l	ug/l	ug/l	ug/l					
Batch number: 18334A94A	Sample number(s): 9916719-9916725								
Benzene	20	20.88	20	20.88	104	104	80-120	0	30
NWTPH-Gx water C7-C12	1100	1371.44	1100	1372.98	125	125	64-131	0	30
Batch number: 18337A94A	Sample number(s): 9916726-9916729,9916731-9916737								
Benzene	20	20.61			103		80-120		
NWTPH-Gx water C7-C12	1100	1428.95			130		64-131		
	ug/l	ug/l	ug/l	ug/l					
Batch number: 183340026A	Sample number(s): 9916719-9916729,9916731-9916736								
Methane	59.83	57.72	59.83	57.48	96	96	85-115	0	20
	ug/l	ug/l	ug/l	ug/l					
Batch number: 183340022A	Sample number(s): 9916725-9916729,9916731-9916736,9916738								
DX DRO C12-C24 w/ SiGel	600.14	233.22			39		10-115		
Batch number: 183380027A	Sample number(s): 9916719-9916724								
DX DRO C12-C24 w/ SiGel	600.14	236.34	600.14	185.62	39	31	10-115	24*	20
	ug/l	ug/l	ug/l	ug/l					
Batch number: 183340705010A	Sample number(s): 9916719-9916728,9916730-9916731								
Manganese	50	52.15			104		85-115		

\*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

## Quality Control Summary

Client Name: Chevron Environmental Mgmt Co  
Reported: 12/10/2018 10:59

Group Number: 2013349

### LCS/LCSD (continued)

Analysis Name	LCS Spike Added ug/l	LCS Conc ug/l	LCSD Spike Added ug/l	LCSD Conc ug/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: 183340705011A Manganese	Sample number(s): 9916732-9916736								
	50	52.72			105		85-115		
	ug/l	ug/l	ug/l	ug/l					
Batch number: 18333520117A Nitrate Nitrogen	Sample number(s): 9916720,9916734								
	750	705.97			94		90-110		
Sulfate	7500	7027.89			94		90-110		
Batch number: 18333520117B Nitrate Nitrogen	Sample number(s): 9916721-9916728,9916730-9916731								
	750	705.97			94		90-110		
Sulfate	7500	7027.89			94		90-110		
Batch number: 18333520206B Nitrate Nitrogen	Sample number(s): 9916735-9916736								
	750	705.94			94		90-110		
Sulfate	7500	7555.34			101		90-110		
Batch number: 18333520217A Nitrate Nitrogen	Sample number(s): 9916719,9916732-9916733								
	750	691.84			92		90-110		
Sulfate	7500	6981.68			93		90-110		

### MS/MSD

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc ug/l	MS Spike Added ug/l	MS Conc ug/l	MSD Spike Added ug/l	MSD Conc ug/l	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Batch number: 18338WAF026	Sample number(s): 9916719-9916729,9916731-9916736,9916738 UNSPK: 9916727									
Benzo(a)anthracene	N.D.	1.01	1.04	1.00	0.984	103	98	67-111	6	30
Benzo(a)pyrene	N.D.	1.01	1.02	1.00	0.952	101	95	69-121	7	30
Benzo(b)fluoranthene	N.D.	1.01	1.00	1.00	0.946	99	94	70-123	6	30
Benzo(k)fluoranthene	N.D.	1.01	1.10	1.00	1.04	109	103	66-120	6	30
Chrysene	N.D.	1.01	1.06	1.00	1.05	105	104	66-109	2	30
Dibenz(a,h)anthracene	N.D.	1.01	0.936	1.00	0.863	93	86	55-123	8	30
Indeno(1,2,3-cd)pyrene	N.D.	1.01	0.987	1.00	1.16	98	115	52-124	16	30
	ug/l	ug/l	ug/l	ug/l	ug/l					
Batch number: 18337A94A	Sample number(s): 9916726-9916729,9916731-9916737 UNSPK: 9916727									
Benzene	N.D.	20	21.36	20	23.15	107	116	80-120	8	30
NWTPH-Gx water C7-C12	N.D.	1100	1492.23	1100	1492.46	136*	136*	64-131	0	30
	ug/l	ug/l	ug/l	ug/l	ug/l					

\*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

## Quality Control Summary

Client Name: Chevron Environmental Mgmt Co  
Reported: 12/10/2018 10:59

Group Number: 2013349

### MS/MSD (continued)

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc ug/l	MS Spike Added ug/l	MS Conc ug/l	MSD Spike Added ug/l	MSD Conc ug/l	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Batch number: 183340026A Methane	Sample number(s): 9916719-9916729,9916731-9916736 UNSPK: 9916727 3.92	59.83	49.81	59.83	43.84	77	67*	73-125	13	30
	ug/l	ug/l	ug/l	ug/l	ug/l					
Batch number: 183340022A DX DRO C12-C24 w/ SiGel	Sample number(s): 9916725-9916729,9916731-9916736,9916738 UNSPK: 9916727 N.D.	607.43	220.93	619.98	190.96	36	31	30-115	15	20
	ug/l	ug/l	ug/l	ug/l	ug/l					
Batch number: 183340705010A Manganese	Sample number(s): 9916719-9916728,9916730-9916731 UNSPK: 9916727 83.48	50	156.27			146*		70-130		
Batch number: 183340705011A Manganese	Sample number(s): 9916732-9916736 UNSPK: 9916732 87.31	50	141.04			107		70-130		
	ug/l	ug/l	ug/l	ug/l	ug/l					
Batch number: 18333520117B Nitrate Nitrogen Sulfate	Sample number(s): 9916721-9916728,9916730-9916731 UNSPK: 9916727 2362.08 144345.1	2500 100000	4662.56 247730.08			92 103		90-110 90-110		
Batch number: 18333520217A Nitrate Nitrogen Sulfate	Sample number(s): 9916719,9916732-9916733 UNSPK: 9916733 N.D. 7486.38	2500 25000	2746.21 34300.53			110 107		90-110 90-110		

### Laboratory Duplicate

Background (BKG) = the sample used in conjunction with the duplicate

Analysis Name	BKG Conc ug/l	DUP Conc ug/l	DUP RPD	DUP RPD Max
Batch number: 183340705010A Manganese	Sample number(s): 9916719-9916728,9916730-9916731 BKG: 9916727 83.48	84.75	2	20
Batch number: 183340705011A Manganese	Sample number(s): 9916732-9916736 BKG: 9916732 87.31	88.36	1	20
	ug/l	ug/l		
Batch number: 18333520117B Nitrate Nitrogen Sulfate	Sample number(s): 9916721-9916728,9916730-9916731 BKG: 9916727 2362.08 144345.1	2378.51 147106.42	1 (1) 2	15 15

\*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

## Quality Control Summary

Client Name: Chevron Environmental Mgmt Co  
Reported: 12/10/2018 10:59

Group Number: 2013349

### Laboratory Duplicate (continued)

Background (BKG) = the sample used in conjunction with the duplicate

Analysis Name	BKG Conc ug/l	DUP Conc ug/l	DUP RPD	DUP RPD Max
Batch number: 18333520217A	Sample number(s): 9916719,9916732-9916733 BKG: 9916733			
Nitrate Nitrogen	N.D.	N.D.	0 (1)	15
Sulfate	7486.38	7298.11	3 (1)	15

### Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: SIM SVOAs 8270D MINI  
Batch number: 18338WAF026

	Fluoranthene-d10	Benzo(a)pyrene-d12	1-Methylnaphthalene-d10
9916719	98	52	81
9916720	109	75	78
9916721	88	53	74
9916722	97	61	77
9916723	99	80	75
9916724	95	29	75
9916725	90	37	67
9916726	89	60	74
9916727	96	78	75
9916728	103	83	74
9916729	105	78	73
9916731	87	59	76
9916732	86	62	71
9916733	81	47	73
9916734	87	44	69
9916735	79	38	68
9916736	85	58	71
9916738	121*	82	79
Blank	99	83	73
LCS	77	74	50
MS	103	83	74
MSD	105	78	73
Limits:	38-119	18-129	29-112

Analysis Name: Method 8021 Water Master  
Batch number: 18334A94A

	Trifluorotoluene-P	Trifluorotoluene-F
9916719	80	77

\*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

## Quality Control Summary

Client Name: Chevron Environmental Mgmt Co  
Reported: 12/10/2018 10:59

Group Number: 2013349

### Surrogate Quality Control (continued)

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: Method 8021 Water Master  
Batch number: 18334A94A

	Trifluorotoluene-P	Trifluorotoluene-F
9916720	80	71
9916721	80	72
9916722	80	76
9916723	81	73
9916724	81	73
9916725	82	75
Blank	81	72
LCS	80	96
LCSD	80	98
Limits:	51-120	50-150

Analysis Name: Method 8021 Water Master  
Batch number: 18337A94A

	Trifluorotoluene-P	Trifluorotoluene-F
9916726	81	77
9916727	82	74
9916728	80	94
9916729	80	95
9916731	82	72
9916732	81	77
9916733	79	76
9916734	81	76
9916735	82	75
9916736	81	77
9916737	82	72
Blank	82	75
LCS	80	100
MS	80	94
MSD	80	95
Limits:	51-120	50-150

Analysis Name: NWTPH-Dx water w/Si Gel  
Batch number: 183340022A

	Orthoterphenyl	Capric Acid
9916725	71	0
9916726	57	0
9916727	62	0
9916728	61	0
9916729	50	0
9916731	59	0

\*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

## Quality Control Summary

Client Name: Chevron Environmental Mgmt Co  
Reported: 12/10/2018 10:59

Group Number: 2013349

### Surrogate Quality Control (continued)

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: NWTPH-Dx water w/Si Gel  
Batch number: 183340022A

	Orthoterphenyl	Capric Acid
9916732	60	0
9916733	51	0
9916734	71	0
9916735	68	0
9916736	54	0
9916738	98	0
Blank	61	0
LCS	66	0
MS	61	0
MSD	50	0

Limits: 50-150 0-1

Analysis Name: Volatile Headspace Hydrocarbon  
Batch number: 183340026A

	Propene
9916719	99
9916720	87
9916721	72
9916722	70
9916723	65
9916724	73
9916725	85
9916726	101
9916727	64
9916728	76
9916729	60
9916731	72
9916732	70
9916733	93
9916734	72
9916735	80
9916736	76
Blank	105
LCS	105
LCSD	102
MS	76
MSD	60

Limits: 46-135

\*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

## Quality Control Summary

Client Name: Chevron Environmental Mgmt Co  
Reported: 12/10/2018 10:59

Group Number: 2013349

### Surrogate Quality Control (continued)

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: NWTPH-Dx water w/Si Gel  
Batch number: 183380027A

	Orthoterphenyl	Capric Acid
9916719	69	0
9916720	58	0
9916721	67	0
9916722	67	0
9916723	71	0
9916724	71	0
Limits:	50-150	0-1

	Orthoterphenyl
Blank	61
LCS	65
LCSD	60
Limits:	50-150

\*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.



# Chevron Northwest Region Analysis Request/Chain of Custody



**Lancaster Laboratories**

Acct. # 11964 Group # 2013349 Sample # 9916719-38  
 For Lancaster Laboratories use only  
 Instructions on reverse side correspond with circled numbers.

1 Client Information				4 Matrix				5 Analyses Requested										6 Remarks								
Facility # <u>Edmonds Terminal</u>		WBS <u>NWENVPUG001430802</u>		<input type="checkbox"/> Sediment <input checked="" type="checkbox"/> Ground <input type="checkbox"/> Surface <input type="checkbox"/> Potable <input type="checkbox"/> NPDES <input type="checkbox"/> Air		Total Number of Containers <input checked="" type="checkbox"/> 8021 <input type="checkbox"/> 8260 <input type="checkbox"/> Naphth		8260 full scan Oxygenates NWTPH GX NWTPH DX <input checked="" type="checkbox"/> Silica Gel Cleanup		Lead <input type="checkbox"/> Total <input type="checkbox"/> Diss. <input type="checkbox"/> Method WAVPH <input type="checkbox"/> WAEPH <input type="checkbox"/>		CRAMS by USEPA 8270 SUM Sulfate, Nitrate by USEPA 300.0 Dissolved Methane by USEPA DSK 175 Dissolved Manganese by USEPA 200.8		SCR #: _____ <input type="checkbox"/> Results in Dry Weight <input type="checkbox"/> J value reporting needed <input type="checkbox"/> Must meet lowest detection limits possible for 8260 compounds <input type="checkbox"/> 8021 MTBE Confirmation <input type="checkbox"/> Confirm MTBE + Naphthalene <input type="checkbox"/> Confirm highest hit by 8260 <input type="checkbox"/> Confirm all hits by 8260 <input type="checkbox"/> Run _____ oxy's on highest hit <input type="checkbox"/> Run _____ oxy's on all hits												
Site Address <u>11720 Under Rd, Edmonds, WA</u>		Chevron PM <u>Kim Solitz</u>																								
Lead Consultant <u>Arcadis</u>		Consultant/Office <u>1100 Olive Way, Suite 800, Seattle, WA 98101</u>																								
Consultant Project Mgr. <u>Samuel Miles</u>		Consultant Phone # _____																								
Sampler <u>Eric Kuegel, Jason Little, Kelsey Frenze</u>		3 Composite <input type="checkbox"/>																								
2 Sample Identification		Collected		Grab	Composite	Soil	Water	Oil	Total Number of Containers	BTEX+MTBE	8021	8260	Naphth	Oxygenates	NWTPH GX	NWTPH DX	Lead	Total	Diss.	Method	WAVPH	WAEPH	CRAMS by USEPA 8270 SUM	Sulfate, Nitrate by USEPA 300.0	Dissolved Methane by USEPA DSK 175	Dissolved Manganese by USEPA 200.8
Date	Time																									
MW-101	11/28/18	1245	X			X	X		11	X				X	X	X							X	X	X	X
MW-129R	11/28/18	0845	X			X	X		11	X				X	X	X							X	X	X	X
MW-139R	11/28/18	1150	X			X	X		11	X				X	X	X							X	X	X	X
MW-502	11/28/18	1130	X			X	X		11	X				X	X	X							X	X	X	X
MW-503	11/28/18	0955	X			X	X		11	X				X	X	X							X	X	X	X
MW-504	11/28/18	1010	X			X	X		11	X				X	X	X							X	X	X	X
MW-505	11/28/18	1106	X			X	X		11	X				X	X	X							X	X	X	X
MW-506	11/28/18	1030	X			X	X		11	X				X	X	X							X	X	X	X
MW-507	11/28/18	0835	X			X	X		11	X				X	X	X							X	X	X	X
MW-507 ms/msd	11/28/18	0835	X			X	X		11	X				X	X	X							X	X	X	X
MW-509	11/28/18	1100	X			X	X		11	X				X	X	X							X	X	X	X
MW-515	11/28/18	1240	X			X	X		11	X				X	X	X							X	X	X	X
MW-518	11/28/18	1205	X			X	X		11	X				X	X	X							X	X	X	X
7 Turnaround Time Requested (TAT) (please circle)				Relinquished by				Date		Time		Received by				Date		Time								
Standard <input checked="" type="radio"/> 5 day 72 hour <input type="radio"/> 48 hour <input type="radio"/> 24 hour				<u>[Signature]</u>				11/28/18		1545		FedEx				11/28/18		1545								
8 Data Package Options (please circle if required)				Relinquished by Commercial Carrier:				Date		Time		Received by				Date		Time								
Type I - Full <input type="checkbox"/> Type VI (Raw Data) <input type="checkbox"/>				UPS <input type="checkbox"/> FedEx <input checked="" type="checkbox"/> Other <input type="checkbox"/>				11/29/18		1030		<u>[Signature]</u>				11/29/18		1030								
Temperature Upon Receipt <u>03.14</u> °C										Custody Seals Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No																

# Chevron Northwest Region Analysis Request/Chain of Custody



**Lancaster Laboratories**

Acct. # 11964

Group # 2013349

Sample # 9916719-38

For Lancaster Laboratories use only  
Instructions on reverse side correspond with circled numbers.

1 Client Information			4 Matrix		5 Analyses Requested										6 Remarks			
Facility # <u>Edmonds Terminal</u> WBS <u>NWENVPM600140802</u> Site Address <u>11720 Unoco Rd, Edmonds, WA</u> Chevron PM <u>Kim Tolitz</u> Lead Consultant <u>Arradis</u> Consultant/Office <u>1100 Olive Way, Suite 800, Seattle, WA 98101</u> Consultant Project Mgr. <u>Samuel Miles</u> Consultant Phone # _____			<input type="checkbox"/> Sediment <input checked="" type="checkbox"/> Ground <input type="checkbox"/> Surface <input type="checkbox"/> Potable <input type="checkbox"/> NPDES <input type="checkbox"/> Air		Total Number of Containers _____ <input type="checkbox"/> BTEX+MTBE <input checked="" type="checkbox"/> 8260 <input type="checkbox"/> Naphth 8260 full scan _____ Oxygenates _____ NWTPH GX _____ NWTPH DX <input checked="" type="checkbox"/> Silica Gel Cleanup Lead Total <input type="checkbox"/> Diss. <input type="checkbox"/> Method _____ WAVPH <input type="checkbox"/> WAEPH <input type="checkbox"/> CPAHS by USEPA 8270SIM Sulfate, Nitrate by USEPA 300.0 Dissolved MetName by USEPA BSC IFS Dissolved Manganese by USEPA 200.8										SCR #: _____ <input type="checkbox"/> Results in Dry Weight <input type="checkbox"/> J value reporting needed <input type="checkbox"/> Must meet lowest detection limits possible for 8260 compounds <input type="checkbox"/> 8021 MTBE Confirmation <input type="checkbox"/> Confirm MTBE + Naphthalene <input type="checkbox"/> Confirm highest hit by 8260 <input type="checkbox"/> Confirm all hits by 8260 <input type="checkbox"/> Run _____ oxy's on highest hit <input type="checkbox"/> Run _____ oxy's on all hits			
2 Sample Identification			3 Composite															
Collected Date Time Grab																		
MW-534 11/28/18 0830 X															* Use Standard SBC			
<del>MW-513 11/28/18 0910 X</del>																		
DUP-1 11/28/18 — X																		
<del>MW-513 11/28/18 0910 X</del>																		
DUP-2 11/28/18 — X															* Dissolved Manganese was field filtered			
<del>MW-513 11/28/18 0910 X</del>																		
Top Blank 11/28/18 —																		
MW-ER 11/28/18 1235 X																		
7 Turnaround Time Requested (TAT) (please circle) <input checked="" type="checkbox"/> Standard 5 day 4 day 72 hour 48 hour 24 hour			Relinquished by <u>[Signature]</u> Date <u>11/28/18</u> Time <u>1545</u>		Received by <u>FedEx</u> Date <u>11/28/18</u> Time <u>1545</u>												9	
8 Data Package Options (please circle if required) Type I - Full Type VI (Raw Data)			Relinquished by Commercial Carrier: UPS _____ FedEx <input checked="" type="checkbox"/> Other _____		Received by <u>[Signature]</u> Date <u>11/29/18</u> Time <u>1030</u>												Temperature Upon Receipt <u>0.3-1.4 °C</u> Custody Seals Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	



Client: Chevron c/o Arcadis

**Delivery and Receipt Information**

Delivery Method:	<u>Fed Ex</u>	Arrival Timestamp:	<u>11/29/2018 10:30</u>
Number of Packages:	<u>4</u>	Number of Projects:	<u>1</u>

**Arrival Condition Summary**

Shipping Container Sealed:	Yes	Sample IDs on COC match Containers:	Yes
Custody Seal Present:	Yes	Sample Date/Times match COC:	Yes
Custody Seal Intact:	Yes	VOA Vial Headspace $\geq$ 6mm:	No
Samples Chilled:	Yes	Total Trip Blank Qty:	4
Paperwork Enclosed:	Yes	Trip Blank Type:	HCI
Samples Intact:	Yes	Air Quality Samples Present:	No
Missing Samples:	No		
Extra Samples:	No		
Discrepancy in Container Qty on COC:	No		

*Unpacked by Nicole Reiff (25684) at 13:05 on 11/29/2018*

**Samples Chilled Details**

Thermometer Types: DT = Digital (Temp. Bottle) IR = Infrared (Surface Temp) All Temperatures in °C.

Cooler #	Thermometer ID	Corrected Temp	Therm. Type	Ice Type	Ice Present?	Ice Container	Elevated Temp?
1	DT146	0.9	DT	Wet	Y	Bagged	N
2	DT146	0.9	DT	Wet	Y	Bagged	N
3	DT146	1.4	DT	Wet	Y	Bagged	N
4	DT146	0.3	DT	Wet	Y	Bagged	N

# Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

<b>BMQL</b>	Below Minimum Quantitation Level	<b>mL</b>	milliliter(s)
<b>C</b>	degrees Celsius	<b>MPN</b>	Most Probable Number
<b>cfu</b>	colony forming units	<b>N.D.</b>	non-detect
<b>CP Units</b>	cobalt-chloroplatinate units	<b>ng</b>	nanogram(s)
<b>F</b>	degrees Fahrenheit	<b>NTU</b>	nephelometric turbidity units
<b>g</b>	gram(s)	<b>pg/L</b>	picogram/liter
<b>IU</b>	International Units	<b>RL</b>	Reporting Limit
<b>kg</b>	kilogram(s)	<b>TNTC</b>	Too Numerous To Count
<b>L</b>	liter(s)	<b>µg</b>	microgram(s)
<b>lb.</b>	pound(s)	<b>µL</b>	microliter(s)
<b>m3</b>	cubic meter(s)	<b>umhos/cm</b>	micromhos/cm
<b>meq</b>	milliequivalents	<b>MCL</b>	Maximum Contamination Limit
<b>mg</b>	milligram(s)		
<b>&lt;</b>	less than		
<b>&gt;</b>	greater than		
<b>ppm</b>	parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.		
<b>ppb</b>	parts per billion		
<b>Dry weight basis</b>	Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.		

**Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.**

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

This report shall not be reproduced except in full, without the written approval of the laboratory.

Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as "analyze immediately" are not performed within 15 minutes.

**WARRANTY AND LIMITS OF LIABILITY** - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. THE FOREGOING EXPRESS WARRANTY IS EXCLUSIVE AND IS GIVEN IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. WE DISCLAIM ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING A WARRANTY OF FITNESS FOR PARTICULAR PURPOSE AND WARRANTY OF MERCHANTABILITY. IN NO EVENT SHALL EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL, LLC BE LIABLE FOR INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR LOSS OF PROFIT OR GOODWILL REGARDLESS OF (A) THE NEGLIGENCE (EITHER SOLE OR CONCURRENT) OF EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL AND (B) WHETHER EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL HAS BEEN INFORMED OF THE POSSIBILITY OF SUCH DAMAGES. We accept no legal responsibility for the purposes for which the client uses the test results. No purchase order or other order for work shall be accepted by Eurofins Lancaster Laboratories Environmental which includes any conditions that vary from the Standard Terms and Conditions, and Eurofins Lancaster Laboratories Environmental hereby objects to any conflicting terms contained in any acceptance or order submitted by client.

# Data Qualifiers

Qualifier	Definition
C	Result confirmed by reanalysis
D1	Indicates for dual column analyses that the result is reported from column 1
D2	Indicates for dual column analyses that the result is reported from column 2
E	Concentration exceeds the calibration range
K1	Initial Calibration Blank is above the QC limit and the sample result is ND
K2	Continuing Calibration Blank is above the QC limit and the sample result is ND
K3	Initial Calibration Verification is above the QC limit and the sample result is ND
K4	Continuing Calibration Verification is above the QC limit and the sample result is ND
J (or G, I, X)	Estimated value $\geq$ the Method Detection Limit (MDL or DL) and $<$ the Limit of Quantitation (LOQ or RL)
P	Concentration difference between the primary and confirmation column $>40\%$ . The lower result is reported.
P^	Concentration difference between the primary and confirmation column $> 40\%$ . The higher result is reported.
U	Analyte was not detected at the value indicated
V	Concentration difference between the primary and confirmation column $>100\%$ . The reporting limit is raised due to this disparity and evident interference.
W	The dissolved oxygen uptake for the unseeded blank is greater than 0.20 mg/L.
Z	Laboratory Defined - see analysis report

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods. Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.



## ANALYSIS REPORT

Prepared by:

Eurofins Lancaster Laboratories Environmental  
2425 New Holland Pike  
Lancaster, PA 17601

Prepared for:

Chevron Environmental Mgmt Co  
BR1 X5139C  
6101 Bollinger Canyon Road  
San Ramon CA 94583

Report Date: December 19, 2018 12:49

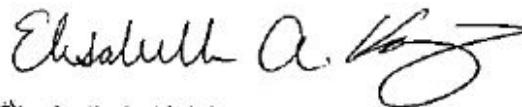
### Project: Edmonds Terminal

Account #: 11964  
Group Number: 2013846  
PO Number: 0015268291  
Release Number: JOLITZ  
State of Sample Origin: WA

Electronic Copy To Arcadis  
Electronic Copy To ARCADIS U.S., Inc.  
Electronic Copy To Arcadis  
Electronic Copy To Arcadis  
Electronic Copy To Arcadis  
Electronic Copy To Arcadis

Attn: Scott Zorn  
Attn: Sam Miles  
Attn: Jason Little  
Attn: Ryan Brauchla  
Attn: Ophelie Encelle  
Attn: Eric Krueger

Respectfully Submitted,



Elisabeth A. Knisley  
Project Manager

(717) 556-7262

To view our laboratory's current scopes of accreditation please go to <http://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster-laboratories-environmental/resources/certifications/>. Historical copies may be requested through your project manager.



## SAMPLE INFORMATION

<u>Client Sample Description</u>	<u>Sample Collection Date/Time</u>	<u>ELLE#</u>
MW-8R-W-181129 Grab Groundwater	11/29/2018 12:20	9918764
MW-20R-W-181129 Grab Groundwater	11/29/2018 11:35	9918765
MW-511-W-181129 Grab Groundwater	11/29/2018 08:35	9918766
MW-513-W-181129 Grab Groundwater	11/29/2018 10:55	9918767
MW-514-W-181129 Grab Groundwater	11/29/2018 11:30	9918768
MW-516-W-181129 Grab Groundwater	11/29/2018 09:50	9918769
MW-517-W-181129 Grab Groundwater	11/29/2018 10:00	9918770
MW-517-W-181129MS Grab Groundwater	11/29/2018 10:00	9918771
MW-517-W-181129MSD Grab Groundwater	11/29/2018 10:00	9918772
MW-517-W-181129DUP Grab Groundwater	11/29/2018 10:00	9918773
MW-519-W-181129 Grab Groundwater	11/29/2018 12:30	9918774
MW-520-W-181129 Grab Groundwater	11/29/2018 12:10	9918775
MW-522-W-181129 Grab Groundwater	11/29/2018 11:40	9918776
MW-512-W-181129 Grab Groundwater	11/29/2018 10:15	9918777
DUP-3-WD-181129 Grab Groundwater	11/29/2018	9918778
QA-T-181129 NA Water	11/29/2018	9918779

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

**Sample Description:** MW-8R-W-181129 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9918764  
**ELLE Group #:** 2013846  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 11/30/2018 10:20  
**Collection Date/Time:** 11/29/2018 12:20

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270D SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14244	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14244	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14244	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14244	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14244	Chrysene	218-01-9	N.D.	0.01	1
14244	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	19	1
<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1
<b>GC Miscellaneous</b>		<b>RSKSOP-175 modified</b>	<b>ug/l</b>	<b>ug/l</b>	
07105	Methane	74-82-8	N.D.	3.0	1
<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	48	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	110	1
The reverse surrogate, capric acid, is present at <1%.					
<b>Metals Dissolved</b>		<b>EPA 200.8 rev 5.4</b>	<b>ug/l</b>	<b>ug/l</b>	
06037	Manganese	7439-96-5	37.8	4.9	1
<b>Wet Chemistry</b>		<b>EPA 300.0</b>	<b>ug/l</b>	<b>ug/l</b>	
00368	Nitrate Nitrogen	14797-55-8	380	250	5
00228	Sulfate	14808-79-8	53,300	1,500	5

### Sample Comments

State of Washington Lab Certification No. C457  
This sample was field filtered for dissolved metals.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	18339WAB026	12/06/2018 13:41	Kira N Beck	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18339WAB026	12/05/2018 16:50	Oswaldo R Sanchez	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18338A94A	12/04/2018 21:22	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18338A94A	12/04/2018 21:22	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18338A94A	12/04/2018 21:21	Jeremy C Giffin	1
07105	Volatile Headspace Hydrocarbon	RSKSOP-175 modified	1	183370020A	12/03/2018 12:07	Connor Lent	1



**Sample Description:** MW-8R-W-181129 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9918764  
**ELLE Group #:** 2013846  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submittal Date/Time:** 11/30/2018 10:20

**Collection Date/Time:** 11/29/2018 12:20

## Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	183380027A	12/07/2018 22:31	Thomas C Wildermuth	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	183380027A	12/04/2018 18:00	Mathias Okpo	1
06037	Manganese	EPA 200.8 rev 5.4	1	183380705001A	12/08/2018 22:18	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	183380705001	12/05/2018 04:05	James L Mertz	1
00368	Nitrate Nitrogen	EPA 300.0	1	18334987117A	11/30/2018 21:23	Clinton M Wilson	5
00228	Sulfate	EPA 300.0	1	18334987117A	11/30/2018 21:23	Clinton M Wilson	5

**Sample Description:** MW-20R-W-181129 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9918765  
**ELLE Group #:** 2013846  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 11/30/2018 10:20

**Collection Date/Time:** 11/29/2018 11:35

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>					
<b>SW-846 8270D SIM</b>			<b>ug/l</b>	<b>ug/l</b>	
14244	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14244	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14244	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14244	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14244	Chrysene	218-01-9	N.D.	0.01	1
14244	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>					
<b>ECY 97-602 NWTPH-Gx</b>			<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	19	1
<b>GC Volatiles</b>					
<b>SW-846 8021B</b>			<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1
<b>GC Miscellaneous</b>					
<b>RSKSOP-175 modified</b>			<b>ug/l</b>	<b>ug/l</b>	
07105	Methane	74-82-8	80	3.0	1
<b>GC Petroleum Hydrocarbons w/Si</b>					
<b>ECY 97-602 NWTPH-Dx modified</b>			<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	46	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1
The reverse surrogate, capric acid, is present at <1%.					
<b>Metals Dissolved</b>					
<b>EPA 200.8 rev 5.4</b>			<b>ug/l</b>	<b>ug/l</b>	
06037	Manganese	7439-96-5	354	4.9	1
<b>Wet Chemistry</b>					
<b>EPA 300.0</b>			<b>ug/l</b>	<b>ug/l</b>	
00368	Nitrate Nitrogen	14797-55-8	N.D.	250	5
00228	Sulfate	14808-79-8	426,000	15,000	50

### Sample Comments

State of Washington Lab Certification No. C457  
This sample was field filtered for dissolved metals.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	18339WAB026	12/06/2018 14:09	Kira N Beck	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18339WAB026	12/05/2018 16:50	Osvaldo R Sanchez	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18338A94A	12/04/2018 21:48	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18338A94A	12/04/2018 21:48	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18338A94A	12/04/2018 21:47	Jeremy C Giffin	1
07105	Volatile Headspace Hydrocarbon	RSKSOP-175 modified	1	183370020A	12/03/2018 12:25	Connor Lent	1

**Sample Description:** MW-20R-W-181129 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9918765  
**ELLE Group #:** 2013846  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submittal Date/Time:** 11/30/2018 10:20

**Collection Date/Time:** 11/29/2018 11:35

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	183380027A	12/07/2018 23:41	Thomas C Wildermuth	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	183380027A	12/04/2018 18:00	Mathias Okpo	1
06037	Manganese	EPA 200.8 rev 5.4	1	183380705001A	12/08/2018 22:20	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	183380705001	12/05/2018 04:05	James L Mertz	1
00368	Nitrate Nitrogen	EPA 300.0	1	18334987117A	11/30/2018 21:40	Clinton M Wilson	5
00228	Sulfate	EPA 300.0	1	18334987117A	11/30/2018 21:57	Clinton M Wilson	50

**Sample Description:** MW-511-W-181129 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9918766  
**ELLE Group #:** 2013846  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 11/30/2018 10:20  
**Collection Date/Time:** 11/29/2018 08:35

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>					
<b>SW-846 8270D SIM</b>			<b>ug/l</b>	<b>ug/l</b>	
14244	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14244	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14244	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14244	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14244	Chrysene	218-01-9	N.D.	0.01	1
14244	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>					
<b>ECY 97-602 NWTPH-Gx</b>			<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	19	1
<b>GC Volatiles</b>					
<b>SW-846 8021B</b>			<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1
<b>GC Miscellaneous</b>					
<b>RSKSOP-175 modified</b>			<b>ug/l</b>	<b>ug/l</b>	
07105	Methane	74-82-8	N.D.	3.0	1
<b>GC Petroleum Hydrocarbons w/Si</b>					
<b>ECY 97-602 NWTPH-Dx modified</b>			<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	45	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1
The reverse surrogate, capric acid, is present at <1%.					
<b>Metals Dissolved</b>					
<b>EPA 200.8 rev 5.4</b>			<b>ug/l</b>	<b>ug/l</b>	
06037	Manganese	7439-96-5	N.D.	4.9	1
<b>Wet Chemistry</b>					
<b>EPA 300.0</b>			<b>ug/l</b>	<b>ug/l</b>	
00368	Nitrate Nitrogen	14797-55-8	340	250	5
00228	Sulfate	14808-79-8	18,200	1,500	5

### Sample Comments

State of Washington Lab Certification No. C457  
This sample was field filtered for dissolved metals.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	18339WAB026	12/06/2018 14:37	Kira N Beck	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18339WAB026	12/05/2018 16:50	Oswaldo R Sanchez	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18338A94A	12/04/2018 22:14	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18338A94A	12/04/2018 22:14	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18338A94A	12/04/2018 22:13	Jeremy C Giffin	1
07105	Volatile Headspace Hydrocarbon	RSKSOP-175 modified	1	183370020A	12/03/2018 12:43	Connor Lent	1

**Sample Description:** MW-511-W-181129 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9918766  
**ELLE Group #:** 2013846  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submittal Date/Time:** 11/30/2018 10:20

**Collection Date/Time:** 11/29/2018 08:35

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	183380027A	12/08/2018 00:05	Thomas C Wildermuth	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	183380027A	12/04/2018 18:00	Mathias Okpo	1
06037	Manganese	EPA 200.8 rev 5.4	1	183380705001A	12/08/2018 22:22	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	183380705001	12/05/2018 04:05	James L Mertz	1
00368	Nitrate Nitrogen	EPA 300.0	1	18334987117A	11/30/2018 22:14	Clinton M Wilson	5
00228	Sulfate	EPA 300.0	1	18334987117A	11/30/2018 22:14	Clinton M Wilson	5

**Sample Description:** MW-513-W-181129 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9918767  
**ELLE Group #:** 2013846  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 11/30/2018 10:20

**Collection Date/Time:** 11/29/2018 10:55

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>					
<b>SW-846 8270D SIM</b>			<b>ug/l</b>	<b>ug/l</b>	
14244	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14244	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14244	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14244	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14244	Chrysene	218-01-9	N.D.	0.01	1
14244	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>					
<b>ECY 97-602 NWTPH-Gx</b>			<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	19	1
<b>GC Volatiles</b>					
<b>SW-846 8021B</b>			<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1
<b>GC Miscellaneous</b>					
<b>RSKSOP-175 modified</b>			<b>ug/l</b>	<b>ug/l</b>	
07105	Methane	74-82-8	450	3.0	1
<b>GC Petroleum Hydrocarbons w/Si</b>					
<b>ECY 97-602 NWTPH-Dx modified</b>			<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	47	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	110	1
The reverse surrogate, capric acid, is present at <1%.					
<b>Metals Dissolved</b>					
<b>EPA 200.8 rev 5.4</b>			<b>ug/l</b>	<b>ug/l</b>	
06037	Manganese	7439-96-5	1,870	4.9	1
<b>Wet Chemistry</b>					
<b>EPA 300.0</b>			<b>ug/l</b>	<b>ug/l</b>	
00368	Nitrate Nitrogen	14797-55-8	500	250	5
00228	Sulfate	14808-79-8	38,900	1,500	5

### Sample Comments

State of Washington Lab Certification No. C457  
This sample was field filtered for dissolved metals.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	18339WAB026	12/06/2018 15:06	Kira N Beck	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18339WAB026	12/05/2018 16:50	Oswaldo R Sanchez	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18338A94A	12/04/2018 22:39	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18338A94A	12/04/2018 22:39	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18338A94A	12/04/2018 22:38	Jeremy C Giffin	1
07105	Volatile Headspace Hydrocarbon	RSKSOP-175 modified	1	183370020A	12/03/2018 13:19	Connor Lent	1

**Sample Description:** MW-513-W-181129 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9918767  
**ELLE Group #:** 2013846  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submittal Date/Time:** 11/30/2018 10:20

**Collection Date/Time:** 11/29/2018 10:55

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	183380027A	12/08/2018 00:28	Thomas C Wildermuth	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	183380027A	12/04/2018 18:00	Mathias Okpo	1
06037	Manganese	EPA 200.8 rev 5.4	1	183380705001A	12/08/2018 22:29	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	183380705001	12/05/2018 04:05	James L Mertz	1
00368	Nitrate Nitrogen	EPA 300.0	1	18334987117A	11/30/2018 22:31	Clinton M Wilson	5
00228	Sulfate	EPA 300.0	1	18334987117A	11/30/2018 22:31	Clinton M Wilson	5

**Sample Description:** MW-514-W-181129 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9918768  
**ELLE Group #:** 2013846  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 11/30/2018 10:20  
**Collection Date/Time:** 11/29/2018 11:30

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>					
<b>SW-846 8270D SIM</b>			<b>ug/l</b>	<b>ug/l</b>	
14244	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14244	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14244	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14244	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14244	Chrysene	218-01-9	N.D.	0.01	1
14244	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>					
<b>ECY 97-602 NWTPH-Gx</b>			<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	19	1
<b>GC Volatiles</b>					
<b>SW-846 8021B</b>			<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1
<b>GC Miscellaneous</b>					
<b>RSKSOP-175 modified</b>			<b>ug/l</b>	<b>ug/l</b>	
07105	Methane	74-82-8	420	3.0	1
<b>GC Petroleum Hydrocarbons w/Si</b>					
<b>ECY 97-602 NWTPH-Dx modified</b>			<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	45	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1
The reverse surrogate, capric acid, is present at <1%.					
<b>Metals Dissolved</b>					
<b>EPA 200.8 rev 5.4</b>			<b>ug/l</b>	<b>ug/l</b>	
06037	Manganese	7439-96-5	1,850	4.9	1
<b>Wet Chemistry</b>					
<b>EPA 300.0</b>			<b>ug/l</b>	<b>ug/l</b>	
00368	Nitrate Nitrogen	14797-55-8	N.D.	250	5
00228	Sulfate	14808-79-8	23,200	1,500	5

### Sample Comments

State of Washington Lab Certification No. C457  
This sample was field filtered for dissolved metals.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	18339WAB026	12/06/2018 15:34	Kira N Beck	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18339WAB026	12/05/2018 16:50	Oswaldo R Sanchez	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18338A94A	12/04/2018 23:05	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18338A94A	12/04/2018 23:05	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18338A94A	12/04/2018 23:04	Jeremy C Giffin	1
07105	Volatile Headspace Hydrocarbon	RSKSOP-175 modified	1	183370020A	12/03/2018 13:38	Connor Lent	1



**Sample Description:** MW-514-W-181129 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9918768  
**ELLE Group #:** 2013846  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submittal Date/Time:** 11/30/2018 10:20

**Collection Date/Time:** 11/29/2018 11:30

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	183410051A	12/14/2018 22:02	Thomas C Wildermuth	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	183410051A	12/10/2018 08:30	Logan M Brosemer	1
06037	Manganese	EPA 200.8 rev 5.4	1	183380705001A	12/08/2018 22:31	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	183380705001	12/05/2018 04:05	James L Mertz	1
00368	Nitrate Nitrogen	EPA 300.0	1	18334987117A	11/30/2018 23:23	Clinton M Wilson	5
00228	Sulfate	EPA 300.0	1	18334987117A	11/30/2018 23:23	Clinton M Wilson	5

**Sample Description:** MW-516-W-181129 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9918769  
**ELLE Group #:** 2013846  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 11/30/2018 10:20  
**Collection Date/Time:** 11/29/2018 09:50

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>					
<b>SW-846 8270D SIM</b>			<b>ug/l</b>	<b>ug/l</b>	
14244	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14244	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14244	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14244	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14244	Chrysene	218-01-9	N.D.	0.01	1
14244	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>					
<b>ECY 97-602 NWTPH-Gx</b>			<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	19	1
<b>GC Volatiles</b>					
<b>SW-846 8021B</b>			<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1
<b>GC Miscellaneous</b>					
<b>RSKSOP-175 modified</b>			<b>ug/l</b>	<b>ug/l</b>	
07105	Methane	74-82-8	N.D.	3.0	1
<b>GC Petroleum Hydrocarbons w/Si</b>					
<b>ECY 97-602 NWTPH-Dx modified</b>			<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	48	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	110	1
The reverse surrogate, capric acid, is present at <1%.					
<b>Metals Dissolved</b>					
<b>EPA 200.8 rev 5.4</b>			<b>ug/l</b>	<b>ug/l</b>	
06037	Manganese	7439-96-5	66.4	4.9	1
<b>Wet Chemistry</b>					
<b>EPA 300.0</b>			<b>ug/l</b>	<b>ug/l</b>	
00368	Nitrate Nitrogen	14797-55-8	1,900	250	5
00228	Sulfate	14808-79-8	21,300	1,500	5

### Sample Comments

State of Washington Lab Certification No. C457  
This sample was field filtered for dissolved metals.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	18339WAB026	12/06/2018 16:02	Kira N Beck	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18339WAB026	12/05/2018 16:50	Oswaldo R Sanchez	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18338A94A	12/04/2018 23:31	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18338A94A	12/04/2018 23:31	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18338A94A	12/04/2018 23:30	Jeremy C Giffin	1
07105	Volatile Headspace Hydrocarbon	RSKSOP-175 modified	1	183370020A	12/03/2018 13:56	Connor Lent	1

**Sample Description:** MW-516-W-181129 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9918769  
**ELLE Group #:** 2013846  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submittal Date/Time:** 11/30/2018 10:20

**Collection Date/Time:** 11/29/2018 09:50

## Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	183410051A	12/14/2018 22:25	Thomas C Wildermuth	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	183410051A	12/10/2018 08:30	Logan M Brosemer	1
06037	Manganese	EPA 200.8 rev 5.4	1	183380705001A	12/08/2018 22:33	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	183380705001	12/05/2018 04:05	James L Mertz	1
00368	Nitrate Nitrogen	EPA 300.0	1	18334987117A	11/30/2018 23:40	Clinton M Wilson	5
00228	Sulfate	EPA 300.0	1	18334987117A	11/30/2018 23:40	Clinton M Wilson	5

**Sample Description:** MW-517-W-181129 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9918770  
**ELLE Group #:** 2013846  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 11/30/2018 10:20  
**Collection Date/Time:** 11/29/2018 10:00

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>					
		<b>SW-846 8270D SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14244	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14244	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14244	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14244	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14244	Chrysene	218-01-9	N.D.	0.01	1
14244	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>					
		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	19	1
<b>GC Volatiles</b>					
		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1
<b>GC Miscellaneous</b>					
		<b>RSKSOP-175 modified</b>	<b>ug/l</b>	<b>ug/l</b>	
07105	Methane	74-82-8	13	3.0	1
<b>GC Petroleum Hydrocarbons w/Si</b>					
		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	46	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1
<b>Metals Dissolved</b>					
		<b>EPA 200.8 rev 5.4</b>	<b>ug/l</b>	<b>ug/l</b>	
06037	Manganese	7439-96-5	62.4	4.9	1
<b>Wet Chemistry</b>					
		<b>EPA 300.0</b>	<b>ug/l</b>	<b>ug/l</b>	
00368	Nitrate Nitrogen	14797-55-8	390	250	5
00228	Sulfate	14808-79-8	21,600	1,500	5

### Sample Comments

State of Washington Lab Certification No. C457  
This sample was field filtered for dissolved metals.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	18339WAB026	12/06/2018 10:24	Kira N Beck	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18339WAB026	12/05/2018 16:50	Oswaldo R Sanchez	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18338A94A	12/04/2018 23:57	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18338A94A	12/04/2018 23:57	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18338A94A	12/04/2018 23:56	Jeremy C Giffin	1
07105	Volatile Headspace Hydrocarbon	RSKSOP-175 modified	1	183370020A	12/03/2018 10:55	Connor Lent	1

**Sample Description:** MW-517-W-181129 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9918770  
**ELLE Group #:** 2013846  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submittal Date/Time:** 11/30/2018 10:20

**Collection Date/Time:** 11/29/2018 10:00

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	183370007A	12/07/2018 19:01	Thomas C Wildermuth	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	183370007A	12/03/2018 19:50	Osvaldo R Sanchez	1
06037	Manganese	EPA 200.8 rev 5.4	1	183380705001A	12/08/2018 22:07	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	183380705001	12/05/2018 04:05	James L Mertz	1
00368	Nitrate Nitrogen	EPA 300.0	1	18334987117A	11/30/2018 20:32	Clinton M Wilson	5
00228	Sulfate	EPA 300.0	1	18334987117A	11/30/2018 20:32	Clinton M Wilson	5

**Sample Description:** MW-517-W-181129MS Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9918771  
**ELLE Group #:** 2013846  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 11/30/2018 10:20  
**Collection Date/Time:** 11/29/2018 10:00

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>					
<b>SW-846 8270D SIM</b>			<b>ug/l</b>	<b>ug/l</b>	
14244	Benzo(a)anthracene	56-55-3	1	0.01	1
14244	Benzo(a)pyrene	50-32-8	0.8	0.01	1
14244	Benzo(b)fluoranthene	205-99-2	0.9	0.01	1
14244	Benzo(k)fluoranthene	207-08-9	0.9	0.01	1
14244	Chrysene	218-01-9	1	0.01	1
14244	Dibenz(a,h)anthracene	53-70-3	0.8	0.02	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	0.9	0.01	1
<b>GC Volatiles</b>					
<b>ECY 97-602 NWTPH-Gx</b>			<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	1,500	19	1
<b>GC Volatiles</b>					
<b>SW-846 8021B</b>			<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	22	0.5	1
<b>GC Miscellaneous</b>					
<b>RSKSOP-175 modified</b>			<b>ug/l</b>	<b>ug/l</b>	
07105	Methane	74-82-8	68	3.0	1
<b>GC Petroleum Hydrocarbons w/Si</b>					
<b>ECY 97-602 NWTPH-Dx modified</b>			<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	270	46	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1
<b>Metals Dissolved</b>					
<b>EPA 200.8 rev 5.4</b>			<b>ug/l</b>	<b>ug/l</b>	
06037	Manganese	7439-96-5	109	4.9	1
<b>Wet Chemistry</b>					
<b>EPA 300.0</b>			<b>ug/l</b>	<b>ug/l</b>	
00368	Nitrate Nitrogen	14797-55-8	3,100	250	5
00228	Sulfate	14808-79-8	48,700	1,500	5

### Sample Comments

State of Washington Lab Certification No. C457  
This sample was field filtered for dissolved metals.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	18339WAB026	12/06/2018 10:52	Kira N Beck	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18339WAB026	12/05/2018 16:50	Oswaldo R Sanchez	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18338A94A	12/05/2018 01:14	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18338A94A	12/05/2018 00:23	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18338A94A	12/05/2018 00:22	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	2	18338A94A	12/05/2018 01:13	Jeremy C Giffin	1
07105	Volatile Headspace Hydrocarbon	RSKSOP-175 modified	1	183370020A	12/03/2018 11:13	Connor Lent	1

**Sample Description:** MW-517-W-181129MS Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9918771  
**ELLE Group #:** 2013846  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submittal Date/Time:** 11/30/2018 10:20

**Collection Date/Time:** 11/29/2018 10:00

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	183370007A	12/07/2018 19:24	Thomas C Wildermuth	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	183370007A	12/03/2018 19:50	Osvaldo R Sanchez	1
06037	Manganese	EPA 200.8 rev 5.4	1	183380705001A	12/08/2018 22:13	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	183380705001	12/05/2018 04:05	James L Mertz	1
00368	Nitrate Nitrogen	EPA 300.0	1	18334987117A	11/30/2018 21:06	Clinton M Wilson	5
00228	Sulfate	EPA 300.0	1	18334987117A	11/30/2018 21:06	Clinton M Wilson	5

**Sample Description:** MW-517-W-181129MSD Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9918772  
**ELLE Group #:** 2013846  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 11/30/2018 10:20  
**Collection Date/Time:** 11/29/2018 10:00

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>					
<b>SW-846 8270D SIM</b>			<b>ug/l</b>	<b>ug/l</b>	
14244	Benzo(a)anthracene	56-55-3	1	0.01	1
14244	Benzo(a)pyrene	50-32-8	1	0.01	1
14244	Benzo(b)fluoranthene	205-99-2	1	0.01	1
14244	Benzo(k)fluoranthene	207-08-9	1	0.01	1
14244	Chrysene	218-01-9	1	0.01	1
14244	Dibenz(a,h)anthracene	53-70-3	1	0.02	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	1	0.01	1
<b>GC Volatiles</b>					
<b>ECY 97-602 NWTPH-Gx</b>			<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	1,500	19	1
<b>GC Volatiles</b>					
<b>SW-846 8021B</b>			<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	22	0.5	1
<b>GC Miscellaneous</b>					
<b>RSKSOP-175 modified</b>			<b>ug/l</b>	<b>ug/l</b>	
07105	Methane	74-82-8	59	3.0	1
<b>GC Petroleum Hydrocarbons w/Si</b>					
<b>ECY 97-602 NWTPH-Dx modified</b>			<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	270	47	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1

### Sample Comments

State of Washington Lab Certification No. C457

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	18339WAB026	12/06/2018 11:20	Kira N Beck	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18339WAB026	12/05/2018 16:50	Osvaldo R Sanchez	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18338A94A	12/05/2018 01:39	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18338A94A	12/05/2018 00:48	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18338A94A	12/05/2018 00:47	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	2	18338A94A	12/05/2018 01:38	Jeremy C Giffin	1
07105	Volatile Headspace Hydrocarbon	RSKSOP-175 modified	1	183370020A	12/03/2018 11:31	Connor Lent	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	183370007A	12/07/2018 19:47	Thomas C Wildermuth	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	183370007A	12/03/2018 19:50	Osvaldo R Sanchez	1



**Sample Description:** MW-517-W-181129DUP Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9918773  
**ELLE Group #:** 2013846  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 11/30/2018 10:20  
**Collection Date/Time:** 11/29/2018 10:00

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>Metals Dissolved</b>					
<b>EPA 200.8 rev 5.4</b>			ug/l	ug/l	
06037	Manganese	7439-96-5	54.8	4.9	1
<b>Wet Chemistry</b>					
<b>EPA 300.0</b>			ug/l	ug/l	
00368	Nitrate Nitrogen	14797-55-8	360	250	5
00228	Sulfate	14808-79-8	19,900	1,500	5

### Sample Comments

State of Washington Lab Certification No. C457  
This sample was field filtered for dissolved metals.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06037	Manganese	EPA 200.8 rev 5.4	1	183380705001A	12/08/2018 22:11	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	183380705001	12/05/2018 04:05	James L Mertz	1
00368	Nitrate Nitrogen	EPA 300.0	1	18334987117A	11/30/2018 20:49	Clinton M Wilson	5
00228	Sulfate	EPA 300.0	1	18334987117A	11/30/2018 20:49	Clinton M Wilson	5

**Sample Description:** MW-519-W-181129 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9918774  
**ELLE Group #:** 2013846  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 11/30/2018 10:20  
**Collection Date/Time:** 11/29/2018 12:30

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270D SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14244	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14244	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14244	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14244	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14244	Chrysene	218-01-9	N.D.	0.01	1
14244	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	19	1
<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1
<b>GC Miscellaneous</b>		<b>RSKSOP-175 modified</b>	<b>ug/l</b>	<b>ug/l</b>	
07105	Methane	74-82-8	N.D.	3.0	1
<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	46	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1
<b>Metals Dissolved</b>		<b>EPA 200.8 rev 5.4</b>	<b>ug/l</b>	<b>ug/l</b>	
06037	Manganese	7439-96-5	8.5	4.9	1
<b>Wet Chemistry</b>		<b>EPA 300.0</b>	<b>ug/l</b>	<b>ug/l</b>	
00368	Nitrate Nitrogen	14797-55-8	350	250	5
00228	Sulfate	14808-79-8	70,100	1,500	5

### Sample Comments

State of Washington Lab Certification No. C457  
This sample was field filtered for dissolved metals.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	18339WAB026	12/06/2018 16:30	Kira N Beck	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18339WAB026	12/05/2018 16:50	Oswaldo R Sanchez	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18338A94A	12/05/2018 02:56	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18338A94A	12/05/2018 02:56	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18338A94A	12/05/2018 02:55	Jeremy C Giffin	1
07105	Volatile Headspace Hydrocarbon	RSKSOP-175 modified	1	183370020A	12/03/2018 14:19	Connor Lent	1

**Sample Description:** MW-519-W-181129 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9918774  
**ELLE Group #:** 2013846  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submittal Date/Time:** 11/30/2018 10:20

**Collection Date/Time:** 11/29/2018 12:30

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	183370007A	12/07/2018 20:11	Thomas C Wildermuth	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	183370007A	12/03/2018 19:50	Osvaldo R Sanchez	1
06037	Manganese	EPA 200.8 rev 5.4	1	183380705001A	12/08/2018 22:35	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	183380705001	12/05/2018 04:05	James L Mertz	1
00368	Nitrate Nitrogen	EPA 300.0	1	18334987117A	11/30/2018 23:57	Clinton M Wilson	5
00228	Sulfate	EPA 300.0	1	18334987117A	11/30/2018 23:57	Clinton M Wilson	5

**Sample Description:** MW-520-W-181129 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9918775  
**ELLE Group #:** 2013846  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 11/30/2018 10:20  
**Collection Date/Time:** 11/29/2018 12:10

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>					
		<b>SW-846 8270D SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14244	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14244	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14244	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14244	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14244	Chrysene	218-01-9	N.D.	0.01	1
14244	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>					
		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	19	1
<b>GC Volatiles</b>					
		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1
<b>GC Miscellaneous</b>					
		<b>RSKSOP-175 modified</b>	<b>ug/l</b>	<b>ug/l</b>	
07105	Methane	74-82-8	7.9	3.0	1
<b>GC Petroleum Hydrocarbons w/Si</b>					
		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	45	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1
<b>Metals Dissolved</b>					
		<b>EPA 200.8 rev 5.4</b>	<b>ug/l</b>	<b>ug/l</b>	
06037	Manganese	7439-96-5	N.D.	4.9	1
<b>Wet Chemistry</b>					
		<b>EPA 300.0</b>	<b>ug/l</b>	<b>ug/l</b>	
00368	Nitrate Nitrogen	14797-55-8	750	250	5
00228	Sulfate	14808-79-8	268,000	15,000	50

### Sample Comments

State of Washington Lab Certification No. C457  
This sample was field filtered for dissolved metals.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	18339WAB026	12/06/2018 16:58	Kira N Beck	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18339WAB026	12/05/2018 16:50	Oswaldo R Sanchez	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18338A94A	12/05/2018 03:22	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18338A94A	12/05/2018 03:22	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18338A94A	12/05/2018 03:21	Jeremy C Giffin	1
07105	Volatile Headspace Hydrocarbon	RSKSOP-175 modified	1	183370020A	12/03/2018 14:37	Connor Lent	1

**Sample Description:** MW-520-W-181129 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9918775  
**ELLE Group #:** 2013846  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submittal Date/Time:** 11/30/2018 10:20

**Collection Date/Time:** 11/29/2018 12:10

## Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	183370007A	12/07/2018 20:34	Thomas C Wildermuth	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	183370007A	12/03/2018 19:50	Osvaldo R Sanchez	1
06037	Manganese	EPA 200.8 rev 5.4	1	183380705001A	12/08/2018 22:37	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	183380705001	12/05/2018 04:05	James L Mertz	1
00368	Nitrate Nitrogen	EPA 300.0	1	18334987117A	12/01/2018 00:14	Clinton M Wilson	5
00228	Sulfate	EPA 300.0	1	18334987117A	12/04/2018 10:16	Clinton M Wilson	50

**Sample Description:** MW-522-W-181129 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9918776  
**ELLE Group #:** 2013846  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 11/30/2018 10:20

**Collection Date/Time:** 11/29/2018 11:40

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>					
<b>SW-846 8270D SIM</b>			<b>ug/l</b>	<b>ug/l</b>	
14244	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14244	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14244	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14244	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14244	Chrysene	218-01-9	N.D.	0.01	1
14244	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>					
<b>ECY 97-602 NWTPH-Gx</b>			<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	19	1
<b>GC Volatiles</b>					
<b>SW-846 8021B</b>			<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1
<b>GC Miscellaneous</b>					
<b>RSKSOP-175 modified</b>			<b>ug/l</b>	<b>ug/l</b>	
07105	Methane	74-82-8	N.D.	3.0	1
<b>GC Petroleum Hydrocarbons w/Si</b>					
<b>ECY 97-602 NWTPH-Dx modified</b>			<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	50	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	110	1
<b>Metals Dissolved</b>					
<b>EPA 200.8 rev 5.4</b>			<b>ug/l</b>	<b>ug/l</b>	
06037	Manganese	7439-96-5	N.D.	4.9	1
<b>Wet Chemistry</b>					
<b>EPA 300.0</b>			<b>ug/l</b>	<b>ug/l</b>	
00368	Nitrate Nitrogen	14797-55-8	340	250	5
00228	Sulfate	14808-79-8	236,000	15,000	50

### Sample Comments

State of Washington Lab Certification No. C457  
This sample was field filtered for dissolved metals.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	18339WAB026	12/06/2018 17:26	Kira N Beck	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18339WAB026	12/05/2018 16:50	Oswaldo R Sanchez	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18338A94A	12/05/2018 03:48	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18338A94A	12/05/2018 03:48	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18338A94A	12/05/2018 03:47	Jeremy C Giffin	1
07105	Volatile Headspace Hydrocarbon	RSKSOP-175 modified	1	183370020A	12/03/2018 14:55	Connor Lent	1

**Sample Description:** MW-522-W-181129 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9918776  
**ELLE Group #:** 2013846  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submittal Date/Time:** 11/30/2018 10:20

**Collection Date/Time:** 11/29/2018 11:40

## Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	183370007A	12/07/2018 20:58	Thomas C Wildermuth	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	183370007A	12/03/2018 19:50	Osvaldo R Sanchez	1
06037	Manganese	EPA 200.8 rev 5.4	1	183380705001A	12/08/2018 22:39	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	183380705001	12/05/2018 04:05	James L Mertz	1
00368	Nitrate Nitrogen	EPA 300.0	1	18334987117A	12/01/2018 00:31	Clinton M Wilson	5
00228	Sulfate	EPA 300.0	1	18334987117A	12/04/2018 10:34	Clinton M Wilson	50

**Sample Description:** MW-512-W-181129 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9918777  
**ELLE Group #:** 2013846  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 11/30/2018 10:20

**Collection Date/Time:** 11/29/2018 10:15

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>					
		<b>SW-846 8270D SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14244	Benzo(a)anthracene	56-55-3	0.02	0.01	1
14244	Benzo(a)pyrene	50-32-8	0.01	0.01	1
14244	Benzo(b)fluoranthene	205-99-2	0.01	0.01	1
14244	Benzo(k)fluoranthene	207-08-9	0.01	0.01	1
14244	Chrysene	218-01-9	0.02	0.01	1
14244	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	0.02	0.01	1
<b>GC Volatiles</b>					
		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	19	1
<b>GC Volatiles</b>					
		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1
<b>GC Miscellaneous</b>					
		<b>RSKSOP-175 modified</b>	<b>ug/l</b>	<b>ug/l</b>	
07105	Methane	74-82-8	93	3.0	1
<b>GC Petroleum Hydrocarbons w/Si</b>					
		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	46	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1
<b>Metals Dissolved</b>					
		<b>EPA 200.8 rev 5.4</b>	<b>ug/l</b>	<b>ug/l</b>	
06037	Manganese	7439-96-5	511	4.9	1
<b>Wet Chemistry</b>					
		<b>EPA 300.0</b>	<b>ug/l</b>	<b>ug/l</b>	
00368	Nitrate Nitrogen	14797-55-8	320	250	5
00228	Sulfate	14808-79-8	38,700	1,500	5

### Sample Comments

State of Washington Lab Certification No. C457  
This sample was field filtered for dissolved metals.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	18339WAB026	12/06/2018 17:54	Kira N Beck	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18339WAB026	12/05/2018 16:50	Oswaldo R Sanchez	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18338A94A	12/05/2018 04:13	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18338A94A	12/05/2018 04:13	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18338A94A	12/05/2018 04:12	Jeremy C Giffin	1
07105	Volatile Headspace Hydrocarbon	RSKSOP-175 modified	1	183370020A	12/03/2018 15:13	Connor Lent	1



**Sample Description:** MW-512-W-181129 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9918777  
**ELLE Group #:** 2013846  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submittal Date/Time:** 11/30/2018 10:20

**Collection Date/Time:** 11/29/2018 10:15

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	183370007A	12/07/2018 21:21	Thomas C Wildermuth	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	183370007A	12/03/2018 19:50	Osvaldo R Sanchez	1
06037	Manganese	EPA 200.8 rev 5.4	1	183380705004A	12/06/2018 00:20	Bradley M Berlot	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	183380705004	12/05/2018 04:05	James L Mertz	1
00368	Nitrate Nitrogen	EPA 300.0	1	18334987117B	12/01/2018 00:48	Clinton M Wilson	5
00228	Sulfate	EPA 300.0	1	18334987117B	12/01/2018 00:48	Clinton M Wilson	5

**Sample Description:** DUP-3-WD-181129 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9918778  
**ELLE Group #:** 2013846  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 11/30/2018 10:20  
**Collection Date/Time:** 11/29/2018

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>					
		<b>SW-846 8270D SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14244	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14244	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14244	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14244	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14244	Chrysene	218-01-9	N.D.	0.01	1
14244	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>					
		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	19	1
<b>GC Volatiles</b>					
		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1
<b>GC Miscellaneous</b>					
		<b>RSKSOP-175 modified</b>	<b>ug/l</b>	<b>ug/l</b>	
07105	Methane	74-82-8	86	3.0	1
<b>GC Petroleum Hydrocarbons w/Si</b>					
		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	45	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1
<b>Metals Dissolved</b>					
		<b>EPA 200.8 rev 5.4</b>	<b>ug/l</b>	<b>ug/l</b>	
06037	Manganese	7439-96-5	353	4.9	1
<b>Wet Chemistry</b>					
		<b>EPA 300.0</b>	<b>ug/l</b>	<b>ug/l</b>	
00368	Nitrate Nitrogen	14797-55-8	N.D.	250	5
00228	Sulfate	14808-79-8	473,000	15,000	50

### Sample Comments

State of Washington Lab Certification No. C457  
This sample was field filtered for dissolved metals.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	18339WAB026	12/06/2018 18:23	Kira N Beck	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18339WAB026	12/05/2018 16:50	Oswaldo R Sanchez	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18338A94A	12/05/2018 04:39	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18338A94A	12/05/2018 04:39	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18338A94A	12/05/2018 04:38	Jeremy C Giffin	1
07105	Volatile Headspace Hydrocarbon	RSKSOP-175 modified	1	183370020A	12/03/2018 15:31	Connor Lent	1

**Sample Description:** DUP-3-WD-181129 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9918778  
**ELLE Group #:** 2013846  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submittal Date/Time:** 11/30/2018 10:20  
**Collection Date/Time:** 11/29/2018

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	183370007A	12/07/2018 21:44	Thomas C Wildermuth	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	183370007A	12/03/2018 19:50	Osvaldo R Sanchez	1
06037	Manganese	EPA 200.8 rev 5.4	1	183380705004A	12/06/2018 00:33	Bradley M Berlot	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	183380705004	12/05/2018 04:05	James L Mertz	1
00368	Nitrate Nitrogen	EPA 300.0	1	18334987117B	12/01/2018 01:39	Clinton M Wilson	5
00228	Sulfate	EPA 300.0	1	18334987117B	12/04/2018 10:52	Clinton M Wilson	50

**Sample Description:** QA-T-181129 NA Water  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9918779  
**ELLE Group #:** 2013846  
**Matrix:** Water

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 11/30/2018 10:20  
**Collection Date/Time:** 11/29/2018

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC Volatiles</b>					
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx n.a.	ug/l N.D.	ug/l 19	1
<b>GC Volatiles</b>					
02102	Benzene	SW-846 8021B 71-43-2	ug/l N.D.	ug/l 0.5	1

### Sample Comments

State of Washington Lab Certification No. C457

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18338A94A	12/04/2018 20:56	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18338A94A	12/04/2018 20:56	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18338A94A	12/04/2018 20:55	Jeremy C Giffin	1

## Quality Control Summary

Client Name: Chevron Environmental Mgmt Co  
Reported: 12/19/2018 12:49

Group Number: 2013846

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

### Method Blank

Analysis Name	Result ug/l	MDL ug/l
Batch number: 18339WAB026	Sample number(s): 9918764-9918772,9918774-9918778	
Benzo(a)anthracene	N.D.	0.01
Benzo(a)pyrene	N.D.	0.01
Benzo(b)fluoranthene	N.D.	0.01
Benzo(k)fluoranthene	N.D.	0.01
Chrysene	N.D.	0.01
Dibenz(a,h)anthracene	N.D.	0.02
Indeno(1,2,3-cd)pyrene	N.D.	0.01
Batch number: 18338A94A	Sample number(s): 9918764-9918772,9918774-9918779	
Benzene	N.D.	0.03
NWTPH-Gx water C7-C12	N.D.	19
Batch number: 183370020A	Sample number(s): 9918764-9918772,9918774-9918778	
Methane	N.D.	3.0
Batch number: 183370007A	Sample number(s): 9918770-9918772,9918774-9918778	
DX DRO C12-C24 w/ SiGel	N.D.	45
DX HRO C24-C40 w/ SiGel	N.D.	100
Batch number: 183380027A	Sample number(s): 9918764-9918767	
DX DRO C12-C24 w/ SiGel	N.D.	45
DX HRO C24-C40 w/ SiGel	N.D.	100
Batch number: 183410051A	Sample number(s): 9918768-9918769	
DX DRO C12-C24 w/ SiGel	N.D.	45
DX HRO C24-C40 w/ SiGel	N.D.	100
Batch number: 183380705001A	Sample number(s): 9918764-9918771,9918773-9918776	
Manganese	N.D.	4.9
Batch number: 183380705004A	Sample number(s): 9918777-9918778	
Manganese	N.D.	4.9
Batch number: 18334987117A	Sample number(s): 9918764-9918771,9918773-9918776	
Nitrate Nitrogen	N.D.	50
Sulfate	N.D.	300
Batch number: 18334987117B	Sample number(s): 9918777-9918778	
Nitrate Nitrogen	N.D.	50
Sulfate	N.D.	300

\*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

## Quality Control Summary

Client Name: Chevron Environmental Mgmt Co  
Reported: 12/19/2018 12:49

Group Number: 2013846

### LCS/LCSD

Analysis Name	LCS Spike Added ug/l	LCS Conc ug/l	LCSD Spike Added ug/l	LCSD Conc ug/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: 18339WAB026	Sample number(s): 9918764-9918772,9918774-9918778								
Benzo(a)anthracene	1.00	0.968			97		67-111		
Benzo(a)pyrene	1.00	1.03			103		69-121		
Benzo(b)fluoranthene	1.00	1.04			104		70-123		
Benzo(k)fluoranthene	1.00	0.979			98		66-120		
Chrysene	1.00	0.967			97		66-109		
Dibenz(a,h)anthracene	1.00	1.04			104		55-123		
Indeno(1,2,3-cd)pyrene	1.00	1.10			110		52-124		
	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>					
Batch number: 18338A94A	Sample number(s): 9918764-9918772,9918774-9918779								
Benzene	20	20.91			105		80-120		
NWTPH-Gx water C7-C12	1100	1378.09			125		64-131		
	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>					
Batch number: 183370020A	Sample number(s): 9918764-9918772,9918774-9918778								
Methane	59.83	61.71	59.83	60.86	103	102	85-115	1	20
	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>					
Batch number: 183370007A	Sample number(s): 9918770-9918772,9918774-9918778								
DX DRO C12-C24 w/ SiGel	600.14	282.21			47		10-115		
Batch number: 183380027A	Sample number(s): 9918764-9918767								
DX DRO C12-C24 w/ SiGel	600.14	236.34	600.14	185.62	39	31	10-115	24*	20
Batch number: 183410051A	Sample number(s): 9918768-9918769								
DX DRO C12-C24 w/ SiGel	600.14	209.4	600.14	244.13	35	41	10-115	15	20
	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>					
Batch number: 183380705001A	Sample number(s): 9918764-9918771,9918773-9918776								
Manganese	50	52.04			104		85-115		
Batch number: 183380705004A	Sample number(s): 9918777-9918778								
Manganese	50	52.85			106		85-115		
	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>					
Batch number: 18334987117A	Sample number(s): 9918764-9918771,9918773-9918776								
Nitrate Nitrogen	750	691.57			92		90-110		
Sulfate	7500	6862.91			92		90-110		
Batch number: 18334987117B	Sample number(s): 9918777-9918778								
Nitrate Nitrogen	750	691.57			92		90-110		
Sulfate	7500	6862.91			92		90-110		

\*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

## Quality Control Summary

Client Name: Chevron Environmental Mgmt Co  
Reported: 12/19/2018 12:49

Group Number: 2013846

### MS/MSD

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc ug/l	MS Spike Added ug/l	MS Conc ug/l	MSD Spike Added ug/l	MSD Conc ug/l	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Batch number: 18339WAB026	Sample number(s): 9918764-9918772,9918774-9918778 UNSPK: 9918770									
Benzo(a)anthracene	N.D.	1.03	1.03	1.01	1.09	100	108	67-111	6	30
Benzo(a)pyrene	N.D.	1.03	0.820	1.01	0.974	80	97	69-121	17	30
Benzo(b)fluoranthene	N.D.	1.03	0.946	1.01	1.03	92	102	70-123	8	30
Benzo(k)fluoranthene	N.D.	1.03	0.873	1.01	0.987	85	98	66-120	12	30
Chrysene	0.0101	1.03	0.983	1.01	1.02	95	100	66-109	4	30
Dibenz(a,h)anthracene	N.D.	1.03	0.822	1.01	1.04	80	103	55-123	23	30
Indeno(1,2,3-cd)pyrene	N.D.	1.03	0.872	1.01	1.10	85	109	52-124	23	30
	ug/l	ug/l	ug/l	ug/l	ug/l					
Batch number: 18338A94A	Sample number(s): 9918764-9918772,9918774-9918779 UNSPK: 9918770									
Benzene	N.D.	20	21.8	20	21.79	109	109	80-120	0	30
NWTPH-Gx water C7-C12	N.D.	1100	1489.47	1100	1491.64	135*	136*	64-131	0	30
	ug/l	ug/l	ug/l	ug/l	ug/l					
Batch number: 183370020A	Sample number(s): 9918764-9918772,9918774-9918778 UNSPK: 9918770									
Methane	13.16	59.83	68.44	59.83	59	92	77	73-125	15	30
	ug/l	ug/l	ug/l	ug/l	ug/l					
Batch number: 183370007A	Sample number(s): 9918770-9918772,9918774-9918778 UNSPK: 9918770									
DX DRO C12-C24 w/ SiGel	N.D.	612.39	272.12	622.55	273.75	44	44	30-115	1	20
	ug/l	ug/l	ug/l	ug/l	ug/l					
Batch number: 183380705001A	Sample number(s): 9918764-9918771,9918773-9918776 UNSPK: 9918770									
Manganese	62.38	50	108.84			93		70-130		
	ug/l	ug/l	ug/l	ug/l	ug/l					
Batch number: 183380705004A	Sample number(s): 9918777-9918778 UNSPK: 9918777									
Manganese	511.45	50	559.1			95 (2)		70-130		
	ug/l	ug/l	ug/l	ug/l	ug/l					
Batch number: 18334987117A	Sample number(s): 9918764-9918771,9918773-9918776 UNSPK: 9918770									
Nitrate Nitrogen	388.18	2500	3079.05			108		90-110		
Sulfate	21551.48	25000	48710.88			109		90-110		
	ug/l	ug/l	ug/l	ug/l	ug/l					
Batch number: 18334987117B	Sample number(s): 9918777-9918778 UNSPK: 9918777									
Nitrate Nitrogen	319.17	2500	3123.73			112*		90-110		
Sulfate	38667.3	25000	71954.89			133*		90-110		
	ug/l	ug/l	ug/l	ug/l	ug/l					

\*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

## Quality Control Summary

Client Name: Chevron Environmental Mgmt Co  
Reported: 12/19/2018 12:49

Group Number: 2013846

### Laboratory Duplicate

Background (BKG) = the sample used in conjunction with the duplicate

Analysis Name	BKG Conc ug/l	DUP Conc ug/l	DUP RPD	DUP RPD Max
Batch number: 183380705001A Manganese	Sample number(s): 9918764-9918771,9918773-9918776 BKG: 9918770			
	62.38	54.76	13	20
Batch number: 183380705004A Manganese	Sample number(s): 9918777-9918778 BKG: 9918777			
	511.45	496.24	3	20
Batch number: 18334987117A Nitrate Nitrogen Sulfate	Sample number(s): 9918764-9918771,9918773-9918776 BKG: 9918770			
	388.18	362.75	7 (1)	15
	21551.48	19921.31	8 (1)	15
Batch number: 18334987117B Nitrate Nitrogen Sulfate	Sample number(s): 9918777-9918778 BKG: 9918777			
	319.17	N.D.	200* (1)	15
	38667.3	38431.96	1	15

### Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: SIM SVOAs 8270D MINI  
Batch number: 18339WAB026

	Fluoranthene-d10	Benzo(a)pyrene-d12	1-Methylnaphthalene-d10
9918764	106	79	86
9918765	93	32	82
9918766	97	85	72
9918767	89	37	73
9918768	94	63	85
9918769	89	83	75
9918770	91	76	76
9918771	95	72	83
9918772	86	87	79
9918774	93	91	73
9918775	87	87	73
9918776	106	90	76
9918777	95	64	63
9918778	90	36	65
Blank	110	103	78
LCS	100	92	63
MS	95	72	83
MSD	86	87	79

\*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.



## Quality Control Summary

Client Name: Chevron Environmental Mgmt Co  
Reported: 12/19/2018 12:49

Group Number: 2013846

### Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: SIM SVOAs 8270D MINI  
Batch number: 18339WAB026

Limits: 38-119 18-129 29-112

Analysis Name: Method 8021 Water Master  
Batch number: 18338A94A

	Trifluorotoluene-P	Trifluorotoluene-F
9918764	82	100
9918765	83	84
9918766	82	75
9918767	81	73
9918768	82	72
9918769	82	75
9918770	82	75
9918771	80	101
9918772	81	98
9918774	82	75
9918775	82	73
9918776	82	77
9918777	81	72
9918778	83	81
9918779	81	76
Blank	82	76
LCS	80	97
MS	80	101
MSD	81	98

Limits: 51-120 50-150

Analysis Name: NWTPH-Dx water w/Si Gel  
Batch number: 183370007A

	Orthoterphenyl	Capric Acid
9918770	78	0
9918771	74	0
9918772	74	0
9918774	68	0
9918775	67	0
9918776	67	0
9918777	78	0
9918778	79	0
Blank	70	0
LCS	80	0
MS	74	0
MSD	74	0

\*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

## Quality Control Summary

Client Name: Chevron Environmental Mgmt Co  
Reported: 12/19/2018 12:49

Group Number: 2013846

### Surrogate Quality Control (continued)

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: NWTPH-Dx water w/Si Gel  
Batch number: 183370007A

Limits: 50-150 0-1

Analysis Name: Volatile Headspace Hydrocarbon  
Batch number: 183370020A

	Propene
9918764	73
9918765	71
9918766	76
9918767	71
9918768	67
9918769	80
9918770	70
9918771	78
9918772	67
9918774	82
9918775	65
9918776	69
9918777	77
9918778	72
Blank	102
LCS	103
LCSD	103
MS	78
MSD	67

Limits: 46-135

Analysis Name: NWTPH-Dx water w/Si Gel  
Batch number: 183380027A

	Orthoterphenyl	Capric Acid
9918764	75	0
9918765	58	0
9918766	65	0
9918767	73	0

Limits: 50-150 0-1

	Orthoterphenyl
Blank	61
LCS	65
LCSD	60

\*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

## Quality Control Summary

Client Name: Chevron Environmental Mgmt Co  
Reported: 12/19/2018 12:49

Group Number: 2013846

### Surrogate Quality Control (continued)

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: NWTPH-Dx water w/Si Gel  
Batch number: 183380027A

Limits: 50-150

Analysis Name: NWTPH-Dx water w/Si Gel  
Batch number: 183410051A

	Orthoterphenyl	Capric Acid
9918768	61	0
9918769	62	0
Blank	58	0
LCS	56	0
LCSD	64	0
Limits:	50-150	0-1

\*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

# Chevron Northwest Region Analysis Request/Chain of Custody



**Lancaster Laboratories**

Acct. # 11964 Group # 2013846 Sample # 9918764-79  
 For Lancaster Laboratories use only  
 Instructions on reverse side correspond with circled numbers.

1 Client Information				4 Matrix				5 Analyses Requested										6 Remarks												
Facility # <u>WBS</u> <u>Edmonds Terminal NWENVPMG001430802</u> Site Address <u>11720 Unaco Road, Edmonds WA</u> Chevron PM <u>Kim Jolitz</u> Lead Consultant <u>Arcadis</u> Consultant/Office <u>1100 Olive Way, Suite 800, Seattle WA 98101</u> Consultant Project Mgr. <u>Samuel Miles</u> Consultant Phone # _____ Sampler <u>Eric Kreuger, Jason Little, Kelsey Franz</u>				Sediment <input type="checkbox"/> Potable <input type="checkbox"/> Ground <input checked="" type="checkbox"/> NPDES <input type="checkbox"/> Surface <input type="checkbox"/> Oil <input type="checkbox"/> Air <input type="checkbox"/> Total Number of Containers _____ BTEX+MTBE <input checked="" type="checkbox"/> 8260 <input type="checkbox"/> Naphth 8260 full scan _____ Oxygenates _____ NWTPH GX _____ NWTPH DX <input type="checkbox"/> Silica Gel Cleanup <input checked="" type="checkbox"/> Lead <input type="checkbox"/> Total <input type="checkbox"/> Diss. <input type="checkbox"/> Method _____ WAVPH <input type="checkbox"/> WAEPH <input type="checkbox"/> CPAHs by USEPA 8270SIM Sulfate, Nitrate by USEPA 3006 Dissolved Methane by USEPA BSK175 Dissolved Manganese by USEPA 200.8				SCR #: _____ <input type="checkbox"/> Results in Dry Weight <input type="checkbox"/> J value reporting needed <input type="checkbox"/> Must meet lowest detection limits possible for 8260 compounds <input type="checkbox"/> 8021 MTBE Confirmation <input type="checkbox"/> Confirm MTBE + Naphthalene <input type="checkbox"/> Confirm highest hit by 8260 <input type="checkbox"/> Confirm all hits by 8260 <input type="checkbox"/> Run _____ oxy's on highest hit <input type="checkbox"/> Run _____ oxy's on all hits																						
2 Sample Identification		3 Collected		Grab	Composite	Soil	Water	Oil	Total Number of Containers	BTEX+MTBE	8260	Naphth	8260 full scan	Oxygenates	NWTPH GX	NWTPH DX	Silica Gel Cleanup	Lead	Total	Diss.	Method	WAVPH	WAEPH	CPAHs by USEPA 8270SIM	Sulfate, Nitrate by USEPA 3006	Dissolved Methane by USEPA BSK175	Dissolved Manganese by USEPA 200.8	6 Remarks		
Date	Time	Date	Time																											
MW-8R	11/29/18	1220		X			X		11	X						X	X							X	X	X	X	*USE Standard SOC *Dissolved Manganese was field filtered *Metal Batch QCs taken at: MW-8R MW-520 MW-514 MW-516 MW-519		
MW-20R	11/29/18	1135		X			X		11	X						X	X							X	X	X	X			
MW-511	11/29/18	0835		X			X		11	X						X	X							X	X	X	X			
MW-513	11/29/18	1055		X			X		11	X						X	X							X	X	X	X			
MW-514	11/29/18	1130		X			X		11	X						X	X							X	X	X	X			
MW-516	11/29/18	0950		X			X		11	X						X	X							X	X	X	X			
MW-517	11/29/18	1000		X			X		11	X						X	X							X	X	X	X			
MW-517 MS/MSD	11/29/18	1000		X			X		22	X						X	X							X	X	X	X			
MW-519	11/29/18	1230		X			X		11	X						X	X							X	X	X	X			
MW-520	11/29/18	1210		X			X		11	X						X	X							X	X	X	X			
MW-522	11/29/18	1140		X			X		11	X						X	X							X	X	X	X			
MW-512	11/29/18	1015		X			X		11	X						X	X							X	X	X	X			
Dup-3	11/29/18			X			X		11	X						X	X							X	X	X	X			
7 Turnaround Time Requested (TAT) (please circle) Standard <input checked="" type="checkbox"/> 5 day      4 day 72 hour      48 hour      24 hour				Relinquished by <u>[Signature]</u> Date <u>11/29/18</u> Time <u>1545</u>				Received by <u>FedEx</u> Date <u>11/29/18</u> Time <u>1545</u>				9																		
				Relinquished by _____ Date _____ Time _____				Received by _____ Date _____ Time _____																						
8 Data Package Options (please circle if required) Type I - Full      Type VI (Raw Data)				Relinquished by Commercial Carrier: UPS _____ FedEx <input checked="" type="checkbox"/> Other _____				Received by <u>[Signature]</u> Date <u>11/30/18</u> Time <u>1000</u>				Temperature Upon Receipt <u>0.6/0.5 °C</u> Custody Seals Intact? <input checked="" type="checkbox"/> Yes      No																		
				Temperature Upon Receipt <u>0.6/0.5 °C</u>				Custody Seals Intact? <input checked="" type="checkbox"/> Yes      No																						

# Chevron Northwest Region Analysis Request/Chain of Custody



**Lancaster Laboratories**

Acct. # 11964 Group # 2013846 Sample # 9918764-79  
For Lancaster Laboratories use only  
 Instructions on reverse side correspond with circled numbers.

1 Client Information				4 Matrix				5 Analyses Requested												6 Remarks	
Facility # <u>Edmonds Terminal NWENVPM6001430302</u> Site Address <u>11720 Unacc Road, Edmonds, WA</u> Chevron PM <u>Kim Julitz</u> Lead Consultant <u>Aracelis</u> Consultant/Office <u>1105 Olive Way, Suite 800, Seattle WA 98101</u> Consultant Project Mgr. <u>Samuel Miles</u> Consultant Phone # _____				<input type="checkbox"/> Sediment <input checked="" type="checkbox"/> Ground <input type="checkbox"/> Surface <input type="checkbox"/> Potable <input type="checkbox"/> NPDES <input type="checkbox"/> Air <input type="checkbox"/> Soil <input type="checkbox"/> Water <input type="checkbox"/> Oil				Total Number of Containers <u>2</u> <input checked="" type="checkbox"/> BTEX+MTBE 8021B <input type="checkbox"/> 8260 full scan <input type="checkbox"/> Oxygenates <input checked="" type="checkbox"/> NWTPH GX <input type="checkbox"/> NWTPH DX <input type="checkbox"/> Silica Gel Cleanup <input type="checkbox"/> Lead <input type="checkbox"/> Total <input type="checkbox"/> Diss. <input type="checkbox"/> Method <input type="checkbox"/> WAVPH <input type="checkbox"/> WAEPH												SCR #: _____ <input type="checkbox"/> Results in Dry Weight <input type="checkbox"/> J value reporting needed <input type="checkbox"/> Must meet lowest detection limits possible for 8260 compounds <input type="checkbox"/> 8021 MTBE Confirmation <input type="checkbox"/> Confirm MTBE + Naphthalene <input type="checkbox"/> Confirm highest hit by 8260 <input type="checkbox"/> Confirm all hits by 8260 <input type="checkbox"/> Run _____ oxy's on highest hit <input type="checkbox"/> Run _____ oxy's on all hits	
2 Sample Identification Collected Date Time Grab Composite <u>Trp Blank</u> <u>11/29/18</u> <u>---</u> <input checked="" type="checkbox"/> <input type="checkbox"/>																					
7 Turnaround Time Requested (TAT) (please circle) <input checked="" type="radio"/> Standard 5 day 4 day 72 hour 48 hour 24 hour				Relinquished by <u>[Signature]</u> Date <u>11/29/18</u> Time <u>1545</u>				Received by <u>FedEx</u> Date <u>11/29/18</u> Time <u>1545</u>													
8 Data Package Options (please circle if required) Type I - Full Type VI (Raw Data)				Relinquished by Commerical Carrier: UPS _____ FedEx <input checked="" type="checkbox"/> Other _____				Received by <u>[Signature]</u> Date <u>11/30/18</u> Time <u>1030</u>													
				Temperature Upon Receipt <u>0.6/0.5°C</u>				Custody Seals Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No													



Client: Chevron c/o Arcadis

**Delivery and Receipt Information**

Delivery Method: Fed Ex                      Arrival Timestamp: 11/30/2018 10:20  
 Number of Packages: 3                      Number of Projects: 1

**Arrival Condition Summary**

Shipping Container Sealed:	Yes	Sample IDs on COC match Containers:	No
Custody Seal Present:	Yes	Sample Date/Times match COC:	Yes
Custody Seal Intact:	Yes	VOA Vial Headspace $\geq$ 6mm:	No
Samples Chilled:	Yes	Total Trip Blank Qty:	2
Paperwork Enclosed:	Yes	Trip Blank Type:	HCI
Samples Intact:	Yes	Air Quality Samples Present:	No
Missing Samples:	No		
Extra Samples:	No		
Discrepancy in Container Qty on COC:	Yes		

*Unpacked by Nicole Reiff (25684) at 12:03 on 11/30/2018*

**Samples Chilled Details**

Thermometer Types:    *DT = Digital (Temp. Bottle)    IR = Infrared (Surface Temp)    All Temperatures in °C.*

Cooler #	Thermometer ID	Corrected Temp	Therm. Type	Ice Type	Ice Present?	Ice Container	Elevated Temp?
1	DT146	0.6	DT	Wet	Y	Bagged	N
2	DT146	0.6	DT	Wet	Y	Bagged	N
3	DT146	0.5	DT	Wet	Y	Bagged	N

**Container Quantity Discrepancy Details**

Sample ID on COC	Container Qty. Received	Container Qty. on COC	Comments
MW-8R	12	11	
MW-514	12	11	
MW-516	12	11	
MW-519	12	11	
MW-520	12	11	

**Sample ID Discrepancy Details**

Sample ID on COC	Sample ID on Label	Comments
DUP-3	MW-3	

# Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

<b>BMQL</b>	Below Minimum Quantitation Level	<b>mL</b>	milliliter(s)
<b>C</b>	degrees Celsius	<b>MPN</b>	Most Probable Number
<b>cfu</b>	colony forming units	<b>N.D.</b>	non-detect
<b>CP Units</b>	cobalt-chloroplatinate units	<b>ng</b>	nanogram(s)
<b>F</b>	degrees Fahrenheit	<b>NTU</b>	nephelometric turbidity units
<b>g</b>	gram(s)	<b>pg/L</b>	picogram/liter
<b>IU</b>	International Units	<b>RL</b>	Reporting Limit
<b>kg</b>	kilogram(s)	<b>TNTC</b>	Too Numerous To Count
<b>L</b>	liter(s)	<b>µg</b>	microgram(s)
<b>lb.</b>	pound(s)	<b>µL</b>	microliter(s)
<b>m3</b>	cubic meter(s)	<b>umhos/cm</b>	micromhos/cm
<b>meq</b>	milliequivalents	<b>MCL</b>	Maximum Contamination Limit
<b>mg</b>	milligram(s)		
<b>&lt;</b>	less than		
<b>&gt;</b>	greater than		
<b>ppm</b>	parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.		
<b>ppb</b>	parts per billion		
<b>Dry weight basis</b>	Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.		

**Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.**

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

This report shall not be reproduced except in full, without the written approval of the laboratory.

Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as "analyze immediately" are not performed within 15 minutes.

**WARRANTY AND LIMITS OF LIABILITY** - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. THE FOREGOING EXPRESS WARRANTY IS EXCLUSIVE AND IS GIVEN IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. WE DISCLAIM ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING A WARRANTY OF FITNESS FOR PARTICULAR PURPOSE AND WARRANTY OF MERCHANTABILITY. IN NO EVENT SHALL EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL, LLC BE LIABLE FOR INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR LOSS OF PROFIT OR GOODWILL REGARDLESS OF (A) THE NEGLIGENCE (EITHER SOLE OR CONCURRENT) OF EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL AND (B) WHETHER EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL HAS BEEN INFORMED OF THE POSSIBILITY OF SUCH DAMAGES. We accept no legal responsibility for the purposes for which the client uses the test results. No purchase order or other order for work shall be accepted by Eurofins Lancaster Laboratories Environmental which includes any conditions that vary from the Standard Terms and Conditions, and Eurofins Lancaster Laboratories Environmental hereby objects to any conflicting terms contained in any acceptance or order submitted by client.

# Data Qualifiers

Qualifier	Definition
C	Result confirmed by reanalysis
D1	Indicates for dual column analyses that the result is reported from column 1
D2	Indicates for dual column analyses that the result is reported from column 2
E	Concentration exceeds the calibration range
K1	Initial Calibration Blank is above the QC limit and the sample result is ND
K2	Continuing Calibration Blank is above the QC limit and the sample result is ND
K3	Initial Calibration Verification is above the QC limit and the sample result is ND
K4	Continuing Calibration Verification is above the QC limit and the sample result is ND
J (or G, I, X)	Estimated value $\geq$ the Method Detection Limit (MDL or DL) and $<$ the Limit of Quantitation (LOQ or RL)
P	Concentration difference between the primary and confirmation column $>40\%$ . The lower result is reported.
P^	Concentration difference between the primary and confirmation column $> 40\%$ . The higher result is reported.
U	Analyte was not detected at the value indicated
V	Concentration difference between the primary and confirmation column $>100\%$ . The reporting limit is raised due to this disparity and evident interference.
W	The dissolved oxygen uptake for the unseeded blank is greater than 0.20 mg/L.
Z	Laboratory Defined - see analysis report

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods. Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.





## ANALYSIS REPORT

Prepared by:

Eurofins Lancaster Laboratories Environmental  
2425 New Holland Pike  
Lancaster, PA 17601

Prepared for:

Chevron Environmental Mgmt Co  
BR1 X5139C  
6101 Bollinger Canyon Road  
San Ramon CA 94583

Report Date: December 17, 2018 17:44

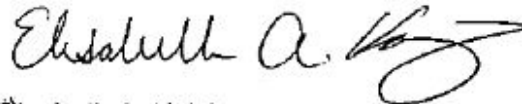
### Project: Edmonds Terminal

Account #: 11964  
Group Number: 2014142  
PO Number: 0015268291  
Release Number: JOLITZ  
State of Sample Origin: WA

Electronic Copy To Arcadis  
Electronic Copy To ARCADIS U.S., Inc.  
Electronic Copy To Arcadis  
Electronic Copy To Arcadis  
Electronic Copy To Arcadis  
Electronic Copy To Arcadis  
Electronic Copy To Arcadis  
Electronic Copy To ARCADIS U.S., Inc.

Attn: Scott Zorn  
Attn: Sam Miles  
Attn: Jason Little  
Attn: Ryan Brauchla  
Attn: Ophelie Encelle  
Attn: Eric Krueger  
Attn: Rebecca Andresen  
Attn: Prajakta Ghatpande

Respectfully Submitted,



Elisabeth A. Knisley  
Project Manager

(717) 556-7262

To view our laboratory's current scopes of accreditation please go to <http://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster-laboratories-environmental/resources/certifications/>. Historical copies may be requested through your project manager.



### SAMPLE INFORMATION

<u>Client Sample Description</u>	<u>Sample Collection Date/Time</u>	<u>ELLE#</u>
MW-126-W-181130 Grab Groundwater	11/30/2018 09:00	9920259
MW-143-W-181130 Grab Groundwater	11/30/2018 10:10	9920260
MW-521-W-181130 Grab Groundwater	11/30/2018 11:20	9920261
DUP-4-WD-181130 Grab Groundwater	11/30/2018	9920262
QA-T-181130 NA Water	11/30/2018	9920263

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

**Sample Description:** MW-126-W-181130 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9920259  
**ELLE Group #:** 2014142  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 12/01/2018 10:30  
**Collection Date/Time:** 11/30/2018 09:00

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>					
		<b>SW-846 8270D SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14244	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14244	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14244	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14244	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14244	Chrysene	218-01-9	N.D.	0.01	1
14244	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>					
		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	19	1
<b>GC Volatiles</b>					
		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1
<b>GC Miscellaneous</b>					
		<b>RSKSOP-175 modified</b>	<b>ug/l</b>	<b>ug/l</b>	
07105	Methane	74-82-8	N.D.	3.0	1
<b>GC Petroleum Hydrocarbons w/Si</b>					
		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	46	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1
<b>Metals Dissolved</b>					
		<b>EPA 200.8 rev 5.4</b>	<b>ug/l</b>	<b>ug/l</b>	
06037	Manganese	7439-96-5	N.D.	4.9	1
<b>Wet Chemistry</b>					
		<b>EPA 300.0</b>	<b>ug/l</b>	<b>ug/l</b>	
00368	Nitrate Nitrogen	14797-55-8	3,100	250	5
00228	Sulfate	14808-79-8	35,800	1,500	5

### Sample Comments

State of Washington Lab Certification No. C457  
This sample was field filtered for dissolved metals.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	18339WAP026	12/06/2018 23:40	Catherine E Bachman	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18339WAP026	12/06/2018 08:00	Logan M Brosemer	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18339A94A	12/05/2018 21:53	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18339A94A	12/05/2018 21:53	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18339A94A	12/05/2018 21:52	Jeremy C Giffin	1
07105	Volatile Headspace Hydrocarbon	RSKSOP-175 modified	1	183370020A	12/03/2018 15:48	Connor Lent	1

**Sample Description:** MW-126-W-181130 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9920259  
**ELLE Group #:** 2014142  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submittal Date/Time:** 12/01/2018 10:30

**Collection Date/Time:** 11/30/2018 09:00

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	183370007A	12/07/2018 22:55	Thomas C Wildermuth	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	183370007A	12/03/2018 19:50	Osvaldo R Sanchez	1
06037	Manganese	EPA 200.8 rev 5.4	1	183370705006A	12/06/2018 07:17	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	183370705006	12/04/2018 04:10	James L Mertz	1
00368	Nitrate Nitrogen	EPA 300.0	1	18225837215A	12/02/2018 01:49	Samuel J Weaver	5
00228	Sulfate	EPA 300.0	1	18225837215A	12/02/2018 01:49	Samuel J Weaver	5

**Sample Description:** MW-143-W-181130 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9920260  
**ELLE Group #:** 2014142  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 12/01/2018 10:30

**Collection Date/Time:** 11/30/2018 10:10

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>					
<b>SW-846 8270D SIM</b>			<b>ug/l</b>	<b>ug/l</b>	
14244	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14244	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14244	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14244	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14244	Chrysene	218-01-9	N.D.	0.01	1
14244	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>					
<b>ECY 97-602 NWTPH-Gx</b>			<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	19	1
<b>GC Volatiles</b>					
<b>SW-846 8021B</b>			<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1
<b>GC Miscellaneous</b>					
<b>RSKSOP-175 modified</b>			<b>ug/l</b>	<b>ug/l</b>	
07105	Methane	74-82-8	6,200	60	20
<b>GC Petroleum Hydrocarbons w/Si</b>					
<b>ECY 97-602 NWTPH-Dx modified</b>			<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	45	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1
<b>Metals Dissolved</b>					
<b>EPA 200.8 rev 5.4</b>			<b>ug/l</b>	<b>ug/l</b>	
06037	Manganese	7439-96-5	1,140	4.9	1
<b>Wet Chemistry</b>					
<b>EPA 300.0</b>			<b>ug/l</b>	<b>ug/l</b>	
00368	Nitrate Nitrogen	14797-55-8	N.D.	250	5
00228	Sulfate	14808-79-8	N.D.	1,500	5

### Sample Comments

State of Washington Lab Certification No. C457  
This sample was field filtered for dissolved metals.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	18339WAP026	12/07/2018 00:09	Catherine E Bachman	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18339WAP026	12/06/2018 08:00	Logan M Brosemer	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18339A94A	12/05/2018 22:19	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18339A94A	12/05/2018 22:19	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18339A94A	12/05/2018 22:18	Jeremy C Giffin	1
07105	Volatile Headspace Hydrocarbon	RSKSOP-175 modified	1	183370020A	12/04/2018 11:24	Connor Lent	20

**Sample Description:** MW-143-W-181130 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9920260  
**ELLE Group #:** 2014142  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submittal Date/Time:** 12/01/2018 10:30

**Collection Date/Time:** 11/30/2018 10:10

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	183370007A	12/07/2018 23:18	Thomas C Wildermuth	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	183370007A	12/03/2018 19:50	Osvaldo R Sanchez	1
06037	Manganese	EPA 200.8 rev 5.4	1	183370705006A	12/06/2018 07:19	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	183370705006	12/04/2018 04:10	James L Mertz	1
00368	Nitrate Nitrogen	EPA 300.0	1	18225837215A	12/02/2018 03:13	Samuel J Weaver	5
00228	Sulfate	EPA 300.0	1	18225837215A	12/02/2018 03:13	Samuel J Weaver	5

**Sample Description:** MW-521-W-181130 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9920261  
**ELLE Group #:** 2014142  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 12/01/2018 10:30  
**Collection Date/Time:** 11/30/2018 11:20

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>					
<b>SW-846 8270D SIM</b>			<b>ug/l</b>	<b>ug/l</b>	
14244	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14244	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14244	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14244	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14244	Chrysene	218-01-9	N.D.	0.01	1
14244	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	0.01	0.01	1
<b>GC Volatiles</b>					
<b>ECY 97-602 NWTPH-Gx</b>			<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	19	1
<b>GC Volatiles</b>					
<b>SW-846 8021B</b>			<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1
<b>GC Miscellaneous</b>					
<b>RSKSOP-175 modified</b>			<b>ug/l</b>	<b>ug/l</b>	
07105	Methane	74-82-8	N.D.	3.0	1
<b>GC Petroleum Hydrocarbons w/Si</b>					
<b>ECY 97-602 NWTPH-Dx modified</b>			<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	46	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1
<b>Metals Dissolved</b>					
<b>EPA 200.8 rev 5.4</b>			<b>ug/l</b>	<b>ug/l</b>	
06037	Manganese	7439-96-5	N.D.	4.9	1
<b>Wet Chemistry</b>					
<b>EPA 300.0</b>			<b>ug/l</b>	<b>ug/l</b>	
00368	Nitrate Nitrogen	14797-55-8	N.D.	250	5
00228	Sulfate	14808-79-8	49,900	1,500	5

### Sample Comments

State of Washington Lab Certification No. C457  
This sample was field filtered for dissolved metals.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	18339WAP026	12/07/2018 00:39	Catherine E Bachman	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18339WAP026	12/06/2018 08:00	Logan M Brosemer	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18339A94A	12/05/2018 22:44	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18339A94A	12/05/2018 22:44	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18339A94A	12/05/2018 22:43	Jeremy C Giffin	1
07105	Volatile Headspace Hydrocarbon	RSKSOP-175 modified	1	183380007A	12/04/2018 12:35	Connor Lent	1

**Sample Description:** MW-521-W-181130 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9920261  
**ELLE Group #:** 2014142  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submittal Date/Time:** 12/01/2018 10:30

**Collection Date/Time:** 11/30/2018 11:20

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	183370007A	12/07/2018 23:41	Thomas C Wildermuth	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	183370007A	12/03/2018 19:50	Osvaldo R Sanchez	1
06037	Manganese	EPA 200.8 rev 5.4	1	183370705006A	12/06/2018 07:21	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	183370705006	12/04/2018 04:10	James L Mertz	1
00368	Nitrate Nitrogen	EPA 300.0	1	18225837215A	12/02/2018 03:29	Samuel J Weaver	5
00228	Sulfate	EPA 300.0	1	18225837215A	12/02/2018 03:29	Samuel J Weaver	5



**Sample Description:** DUP-4-WD-181130 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9920262  
**ELLE Group #:** 2014142  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 12/01/2018 10:30  
**Collection Date/Time:** 11/30/2018

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC/MS Semivolatiles</b>					
		<b>SW-846 8270D SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14244	Benzo(a)anthracene	56-55-3	N.D.	0.01	1
14244	Benzo(a)pyrene	50-32-8	N.D.	0.01	1
14244	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	1
14244	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	1
14244	Chrysene	218-01-9	0.01	0.01	1
14244	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	1
<b>GC Volatiles</b>					
		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	19	1
<b>GC Volatiles</b>					
		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.5	1
<b>GC Miscellaneous</b>					
		<b>RSKSOP-175 modified</b>	<b>ug/l</b>	<b>ug/l</b>	
07105	Methane	74-82-8	N.D.	3.0	1
<b>GC Petroleum Hydrocarbons w/Si</b>					
		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	45	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	1
<b>Metals Dissolved</b>					
		<b>EPA 200.8 rev 5.4</b>	<b>ug/l</b>	<b>ug/l</b>	
06037	Manganese	7439-96-5	N.D.	4.9	1
<b>Wet Chemistry</b>					
		<b>EPA 300.0</b>	<b>ug/l</b>	<b>ug/l</b>	
00368	Nitrate Nitrogen	14797-55-8	3,600	250	5
00228	Sulfate	14808-79-8	43,500	1,500	5

### Sample Comments

State of Washington Lab Certification No. C457  
This sample was field filtered for dissolved metals.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	18339WAP026	12/07/2018 01:08	Catherine E Bachman	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	18339WAP026	12/06/2018 08:00	Logan M Brosemer	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18339A94A	12/05/2018 23:10	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18339A94A	12/05/2018 23:10	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18339A94A	12/05/2018 23:09	Jeremy C Giffin	1
07105	Volatile Headspace Hydrocarbon	RSKSOP-175 modified	1	183380007A	12/04/2018 12:53	Connor Lent	1

**Sample Description:** DUP-4-WD-181130 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9920262  
**ELLE Group #:** 2014142  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submittal Date/Time:** 12/01/2018 10:30

**Collection Date/Time:** 11/30/2018

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	183370007A	12/08/2018 00:05	Thomas C Wildermuth	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	183370007A	12/03/2018 19:50	Osvaldo R Sanchez	1
06037	Manganese	EPA 200.8 rev 5.4	1	183370705006A	12/06/2018 06:51	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	183370705006	12/04/2018 04:10	James L Mertz	1
00368	Nitrate Nitrogen	EPA 300.0	1	18225837215A	12/01/2018 22:29	Samuel J Weaver	5
00228	Sulfate	EPA 300.0	1	18225837215A	12/01/2018 22:29	Samuel J Weaver	5

**Sample Description:** QA-T-181130 NA Water  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

Chevron Environmental Mgmt Co  
ELLE Sample #: WW 9920263  
ELLE Group #: 2014142  
Matrix: Water

**Project Name:** Edmonds Terminal

Submittal Date/Time: 12/01/2018 10:30  
Collection Date/Time: 11/30/2018

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
<b>GC Volatiles</b>					
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx n.a.	ug/l N.D.	ug/l 19	1
<b>GC Volatiles</b>					
02102	Benzene	SW-846 8021B 71-43-2	ug/l N.D.	ug/l 0.5	1

### Sample Comments

State of Washington Lab Certification No. C457

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	18339A94A	12/05/2018 21:27	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	18339A94A	12/05/2018 21:27	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	18339A94A	12/05/2018 21:26	Jeremy C Giffin	1

## Quality Control Summary

Client Name: Chevron Environmental Mgmt Co  
Reported: 12/17/2018 17:44

Group Number: 2014142

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

### Method Blank

Analysis Name	Result ug/l	MDL ug/l
Batch number: 18339WAP026	Sample number(s): 9920259-9920262	
Benzo(a)anthracene	N.D.	0.01
Benzo(a)pyrene	N.D.	0.01
Benzo(b)fluoranthene	N.D.	0.01
Benzo(k)fluoranthene	N.D.	0.01
Chrysene	N.D.	0.01
Dibenz(a,h)anthracene	N.D.	0.02
Indeno(1,2,3-cd)pyrene	N.D.	0.01
Batch number: 18339A94A	Sample number(s): 9920259-9920263	
Benzene	N.D.	0.03
NWTPH-Gx water C7-C12	N.D.	19
Batch number: 183370020A	Sample number(s): 9920259-9920260	
Methane	N.D.	3.0
Batch number: 183380007A	Sample number(s): 9920261-9920262	
Methane	N.D.	3.0
Batch number: 183370007A	Sample number(s): 9920259-9920262	
DX DRO C12-C24 w/ SiGel	N.D.	45
DX HRO C24-C40 w/ SiGel	N.D.	100
Batch number: 183370705006A	Sample number(s): 9920259-9920262	
Manganese	N.D.	4.9
Batch number: 18225837215A	Sample number(s): 9920259-9920262	
Nitrate Nitrogen	N.D.	50
Sulfate	N.D.	300

### LCS/LCSD

Analysis Name	LCS Spike Added ug/l	LCS Conc ug/l	LCSD Spike Added ug/l	LCSD Conc ug/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: 18339WAP026	Sample number(s): 9920259-9920262								
Benzo(a)anthracene	1.00	1.01	1.00	1.03	101	103	67-111	1	30
Benzo(a)pyrene	1.00	1.08	1.00	1.09	108	109	69-121	1	30
Benzo(b)fluoranthene	1.00	1.10	1.00	1.10	110	110	70-123	0	30

\*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

## Quality Control Summary

Client Name: Chevron Environmental Mgmt Co  
Reported: 12/17/2018 17:44

Group Number: 2014142

### LCS/LCSD (continued)

Analysis Name	LCS Spike Added ug/l	LCS Conc ug/l	LCSD Spike Added ug/l	LCSD Conc ug/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Benzo(k)fluoranthene	1.00	1.10	1.00	1.13	110	113	66-120	2	30
Chrysene	1.00	1.07	1.00	1.08	107	108	66-109	2	30
Dibenz(a,h)anthracene	1.00	0.986	1.00	1.03	99	103	55-123	4	30
Indeno(1,2,3-cd)pyrene	1.00	1.06	1.00	1.08	106	108	52-124	2	30
	ug/l	ug/l	ug/l	ug/l					
Batch number: 18339A94A	Sample number(s): 9920259-9920263								
Benzene	20	21.43	20	19.94	107	100	80-120	7	30
NWTPH-Gx water C7-C12	1100	1352.87	1100	1385.34	123	126	64-131	2	30
	ug/l	ug/l	ug/l	ug/l					
Batch number: 183370020A	Sample number(s): 9920259-9920260								
Methane	59.83	61.71	59.83	60.86	103	102	85-115	1	20
Batch number: 183380007A	Sample number(s): 9920261-9920262								
Methane	59.83	61.76	59.83	62.64	103	105	85-115	1	20
	ug/l	ug/l	ug/l	ug/l					
Batch number: 183370007A	Sample number(s): 9920259-9920262								
DX DRO C12-C24 w/ SiGel	600.14	282.21			47		10-115		
	ug/l	ug/l	ug/l	ug/l					
Batch number: 183370705006A	Sample number(s): 9920259-9920262								
Manganese	50	51.8			104		85-115		
	ug/l	ug/l	ug/l	ug/l					
Batch number: 18225837215A	Sample number(s): 9920259-9920262								
Nitrate Nitrogen	750	722.92			96		90-110		
Sulfate	7500	7173.68			96		90-110		

### MS/MSD

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc ug/l	MS Spike Added ug/l	MS Conc ug/l	MSD Spike Added ug/l	MSD Conc ug/l	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Batch number: 183370705006A	Sample number(s): 9920259-9920262 UNSPK: 9920262									
Manganese	N.D.	50	53.54			107		70-130		
	ug/l	ug/l	ug/l	ug/l	ug/l					
Batch number: 18225837215A	Sample number(s): 9920259-9920262 UNSPK: 9920259									

\*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

## Quality Control Summary

Client Name: Chevron Environmental Mgmt Co  
Reported: 12/17/2018 17:44

Group Number: 2014142

### MS/MSD (continued)

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc ug/l	MS Spike Added ug/l	MS Conc ug/l	MSD Spike Added ug/l	MSD Conc ug/l	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Nitrate Nitrogen	3074.12	2500	5449.17			95		90-110		
Sulfate	35787.26	25000	64398.77			114*		90-110		

### Laboratory Duplicate

Background (BKG) = the sample used in conjunction with the duplicate

Analysis Name	BKG Conc ug/l	DUP Conc ug/l	DUP RPD	DUP RPD Max
Batch number: 183370705006A Manganese	Sample number(s): 9920259-9920262 BKG: 9920262 N.D.	N.D.	0 (1)	20
Batch number: 18225837215A Nitrate Nitrogen	Sample number(s): 9920259-9920262 BKG: 9920259 3074.12	3044.73	1	15
Sulfate	35787.26	35084.79	2	15

### Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: SIM SVOAs 8270D MINI  
Batch number: 18339WAP026

	Fluoranthene-d10	Benzo(a)pyrene-d12	1-Methylnaphthalene-d10
9920259	108	78	82
9920260	85	77	79
9920261	86	80	77
9920262	91	73	79
Blank	91	86	84
LCS	90	90	87
LCSD	89	92	85
Limits:	38-119	18-129	29-112

Analysis Name: Method 8021 Water Master  
Batch number: 18339A94A

\*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

## Quality Control Summary

Client Name: Chevron Environmental Mgmt Co  
Reported: 12/17/2018 17:44

Group Number: 2014142

### Surrogate Quality Control (continued)

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: Method 8021 Water Master  
Batch number: 18339A94A

	Trifluorotoluene-P	Trifluorotoluene-F
9920259	81	75
9920260	81	73
9920261	81	71
9920262	82	95
9920263	82	73
Blank	82	74
LCS	80	94
LCSD	80	98
Limits:	51-120	50-150

Analysis Name: NWTPH-Dx water w/Si Gel  
Batch number: 183370007A

	Orthoterphenyl	Capric Acid
9920259	84	0
9920260	78	0
9920261	85	0
9920262	73	0
Blank	70	0
LCS	80	0
Limits:	50-150	0-1

Analysis Name: Volatile Headspace Hydrocarbon  
Batch number: 183370020A

	Propene
9920259	75
9920260	106
Blank	102
LCS	103
LCSD	103
Limits:	46-135

Analysis Name: Volatile Headspace Hydrocarbon  
Batch number: 183380007A

	Propene
9920261	74
9920262	69
Blank	102
LCS	102
LCSD	105

\*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

## Quality Control Summary

Client Name: Chevron Environmental Mgmt Co  
Reported: 12/17/2018 17:44

Group Number: 2014142

### Surrogate Quality Control (continued)

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: Volatile Headspace Hydrocarbon  
Batch number: 183380007A

Limits: 46-135

\*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.



# Chevron Northwest Region Analysis Request/Chain of Custody



Lancaster Laboratories

Acct. # 11964

For Lancaster Laboratories use only: Group # 2016142 Sample # 9920259-63

Instructions on reverse side correspond with circled numbers.

1 Client Information				4 Matrix				5 Analyses Requested										6 Remarks		
Facility #		WBS		<input type="checkbox"/> Sediment <input checked="" type="checkbox"/> Potable <input checked="" type="checkbox"/> Ground <input type="checkbox"/> Surface <input type="checkbox"/> NPDES <input type="checkbox"/> Air		Total Number of Containers		BTEX-MTBE <input checked="" type="checkbox"/> 8021 <input type="checkbox"/> 8260 <input type="checkbox"/> Naphth 8260 full scan Oxygenates NWTPH GX NWTPH DX <input type="checkbox"/> Silica Gel Cleanup <input checked="" type="checkbox"/> Lead <input type="checkbox"/> Total <input type="checkbox"/> Diss. <input type="checkbox"/> Method WAVPH <input type="checkbox"/> WAEPH <input type="checkbox"/> CPATHs by USEPA 8270 SIM Sulfate, Nitrate by USEPA 300.0 Dissolved Methane by USEPA 25K175 Dissolved Manganese by USEPA 200.8										SCR #: _____  <input type="checkbox"/> Results in Dry Weight <input type="checkbox"/> J value reporting needed <input type="checkbox"/> Must meet lowest detection limits possible for 8260 compounds <input type="checkbox"/> 8021 MTBE Confirmation <input type="checkbox"/> Confirm MTBE + Naphthalene <input type="checkbox"/> Confirm highest hit by 8260 <input type="checkbox"/> Confirm all hits by 8260 <input type="checkbox"/> Run _____ oxy's on highest hit <input type="checkbox"/> Run _____ oxy's on all hits		
Site Address		Edmonds Terminal NWENVRUG001430802																		
Chevron PM		Lead Consultant																		
Consultant/Office		Arcadis																		
Consultant Project Mgr.		Samuel Miles																		
Consultant Phone #																				
Sampler		Kelsey Franz																		
2 Sample Identification				3																
		Collected		Grab		Composite														
		Date	Time																	
MW-126		11/30/18	0900	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	* use standard SEC * Dissolved manganese was field filtered		
MW-143		11/30/18	1010	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			
MW-521		11/30/18	1120	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			
DUP-4		11/30/18		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			
Trip Blank				<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			
7 Turnaround Time Requested (TAT) (please circle)				Relinquished by		Date		Time		Received by		Date		Time						
Standard <input checked="" type="checkbox"/> 5 day      4 day 72 hour      48 hour      24 hour				[Signature]		11/30/18		1300		[Signature] FedEx		11/30/18		1300						
8 Data Package Options (please circle if required)				Relinquished by		Date		Time		Received by		Date		Time						
Type I - Full      Type VI (Raw Data)				[Signature]						[Signature]		12-1-18		1030						
				UPS _____ FedEx _____ Other _____						Custody Seals Intact?		Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>								
				Temperature Upon Receipt		0.5 °C														



Client: Arcadis

**Delivery and Receipt Information**

Delivery Method: Fed Ex                      Arrival Timestamp: 12/01/2018 10:30  
 Number of Packages: 1                      Number of Projects: 1  
 State/Province of Origin: WA

**Arrival Condition Summary**

Shipping Container Sealed:	Yes	Sample IDs on COC match Containers:	Yes
Custody Seal Present:	Yes	Sample Date/Times match COC:	Yes
Custody Seal Intact:	Yes	VOA Vial Headspace ≥ 6mm:	No
Samples Chilled:	Yes	Total Trip Blank Qty:	1
Paperwork Enclosed:	Yes	Trip Blank Type:	HCI
Samples Intact:	Yes	Air Quality Samples Present:	No
Missing Samples:	No		
Extra Samples:	No		
Discrepancy in Container Qty on COC:	No		

*Unpacked by Melvin Sanchez (8943) at 11:57 on 12/01/2018*

**Samples Chilled Details**

Thermometer Types:    *DT = Digital (Temp. Bottle)    IR = Infrared (Surface Temp)*    *All Temperatures in °C.*

Cooler #	Thermometer ID	Corrected Temp	Therm. Type	Ice Type	Ice Present?	Ice Container	Elevated Temp?
1	DT131	0.5	DT	Wet	Y	Bagged	N

# Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

<b>BMQL</b>	Below Minimum Quantitation Level	<b>mL</b>	milliliter(s)
<b>C</b>	degrees Celsius	<b>MPN</b>	Most Probable Number
<b>cfu</b>	colony forming units	<b>N.D.</b>	non-detect
<b>CP Units</b>	cobalt-chloroplatinate units	<b>ng</b>	nanogram(s)
<b>F</b>	degrees Fahrenheit	<b>NTU</b>	nephelometric turbidity units
<b>g</b>	gram(s)	<b>pg/L</b>	picogram/liter
<b>IU</b>	International Units	<b>RL</b>	Reporting Limit
<b>kg</b>	kilogram(s)	<b>TNTC</b>	Too Numerous To Count
<b>L</b>	liter(s)	<b>µg</b>	microgram(s)
<b>lb.</b>	pound(s)	<b>µL</b>	microliter(s)
<b>m3</b>	cubic meter(s)	<b>umhos/cm</b>	micromhos/cm
<b>meq</b>	milliequivalents	<b>MCL</b>	Maximum Contamination Limit
<b>mg</b>	milligram(s)		
<b>&lt;</b>	less than		
<b>&gt;</b>	greater than		
<b>ppm</b>	parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.		
<b>ppb</b>	parts per billion		
<b>Dry weight basis</b>	Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.		

**Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.**

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

This report shall not be reproduced except in full, without the written approval of the laboratory.

Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as "analyze immediately" are not performed within 15 minutes.

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# Data Qualifiers

Qualifier	Definition
C	Result confirmed by reanalysis
D1	Indicates for dual column analyses that the result is reported from column 1
D2	Indicates for dual column analyses that the result is reported from column 2
E	Concentration exceeds the calibration range
K1	Initial Calibration Blank is above the QC limit and the sample result is ND
K2	Continuing Calibration Blank is above the QC limit and the sample result is ND
K3	Initial Calibration Verification is above the QC limit and the sample result is ND
K4	Continuing Calibration Verification is above the QC limit and the sample result is ND
J (or G, I, X)	Estimated value $\geq$ the Method Detection Limit (MDL or DL) and $<$ the Limit of Quantitation (LOQ or RL)
P	Concentration difference between the primary and confirmation column $>40\%$ . The lower result is reported.
P^	Concentration difference between the primary and confirmation column $> 40\%$ . The higher result is reported.
U	Analyte was not detected at the value indicated
V	Concentration difference between the primary and confirmation column $>100\%$ . The reporting limit is raised due to this disparity and evident interference.
W	The dissolved oxygen uptake for the unseeded blank is greater than 0.20 mg/L.
Z	Laboratory Defined - see analysis report

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods. Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.



## ANALYSIS REPORT

Prepared by:

Eurofins Lancaster Laboratories Environmental  
2425 New Holland Pike  
Lancaster, PA 17601

Prepared for:

Chevron Environmental Mgmt Co  
BR1 X5139C  
6101 Bollinger Canyon Road  
San Ramon CA 94583

Report Date: February 18, 2019 17:34

### Project: Edmonds Terminal

Account #: 11964  
Group Number: 2028569  
PO Number: 0015300236  
Release Number: JOLITZ  
State of Sample Origin: WA

Electronic Copy To Arcadis  
Electronic Copy To ARCADIS U.S., Inc.  
Electronic Copy To Arcadis  
Electronic Copy To Arcadis  
Electronic Copy To Arcadis  
Electronic Copy To Arcadis

Attn: Scott Zorn  
Attn: Sam Miles  
Attn: Jason Little  
Attn: Ryan Brauchla  
Attn: Ophelie Encelle  
Attn: Eric Krueger

Respectfully Submitted,



Amek Carter  
Specialist

(717) 556-7252

To view our laboratory's current scopes of accreditation please go to <https://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster-laboratories-environmental/certifications-and-accreditations-eurofins-lancaster-laboratories-environmental/> . Historical copies may be requested through your project manager.



### SAMPLE INFORMATION

<u>Client Sample Description</u>	<u>Sample Collection Date/Time</u>	<u>ELLE#</u>
MW-101-W-190207 Grab Groundwater	02/07/2019 11:50	9982783
MW-129R-W-190207 Grab Groundwater	02/07/2019 10:00	9982784
MW-129R-W-190207 MS Grab Groundwater	02/07/2019 10:00	9982785
MW-129R-W-190207 MSD Grab Groundwater	02/07/2019 10:00	9982786
MW-518-W-190207 Grab Groundwater	02/07/2019 11:45	9982787
MW-526-W-190207 Grab Groundwater	02/07/2019 11:00	9982788
MW-E-R-W-190207 Grab Groundwater	02/07/2019 09:50	9982789
DUP-1-WD-190207 Grab Groundwater	02/07/2019	9982790
QA-T-190207 NA Water	02/07/2019	9982791

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

**Sample Description:** MW-101-W-190207 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9982783  
**ELLE Group #:** 2028569  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 02/08/2019 10:10  
**Collection Date/Time:** 02/07/2019 11:50

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270D SIM</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	
14244	Benzo(a)anthracene	56-55-3	N.D.	0.01	0.05	1
14244	Benzo(a)pyrene	50-32-8	N.D.	0.01	0.05	1
14244	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	0.05	1
14244	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	0.05	1
14244	Chrysene	218-01-9	N.D.	0.01	0.05	1
14244	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	0.07	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	0.05	1
<b>GC Volatiles</b>		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	19	250	1
<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.03	1.0	1
<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	46	100	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	260	1

### Sample Comments

State of Washington Lab Certification No. C457  
Carcinogenic PAHs have been reported for this sample.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	19039WAS026	02/16/2019 11:46	Edward C Monborne	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	19039WAS026	02/11/2019 08:30	Logan M Brosemer	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	19042A94A	02/11/2019 21:06	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	19042A94A	02/11/2019 21:06	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	19042A94A	02/11/2019 21:05	Jeremy C Giffin	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	190440026A	02/17/2019 12:15	Heather E Williams	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	190440026A	02/14/2019 08:00	Joshua S Ruth	1

\*=This limit was used in the evaluation of the final result

**Sample Description:** MW-129R-W-190207 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9982784  
**ELLE Group #:** 2028569  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 02/08/2019 10:10  
**Collection Date/Time:** 02/07/2019 10:00

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270D SIM</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	
14244	Benzo(a)anthracene	56-55-3	N.D.	0.01	0.05	1
14244	Benzo(a)pyrene	50-32-8	N.D.	0.01	0.05	1
14244	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	0.05	1
14244	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	0.05	1
14244	Chrysene	218-01-9	N.D.	0.01	0.05	1
14244	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	0.07	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	0.05	1
<b>GC Volatiles</b>		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	33 J	19	250	1
<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.03	1.0	1
<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	46 J	45	100	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	250	1

### Sample Comments

State of Washington Lab Certification No. C457  
Carcinogenic PAHs have been reported for this sample.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	19039WAS026	02/16/2019 12:13	Edward C Monborne	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	19039WAS026	02/11/2019 08:30	Logan M Brosemer	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	19042A94A	02/11/2019 21:32	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	19042A94A	02/11/2019 21:32	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	19042A94A	02/11/2019 21:31	Jeremy C Giffin	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	190440026A	02/17/2019 12:38	Heather E Williams	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	190440026A	02/14/2019 08:00	Joshua S Ruth	1

\*=This limit was used in the evaluation of the final result



**Sample Description:** MW-129R-W-190207 MS Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9982785  
**ELLE Group #:** 2028569  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 02/08/2019 10:10  
**Collection Date/Time:** 02/07/2019 10:00

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270D SIM</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	
14244	Benzo(a)anthracene	56-55-3	1	0.01	0.05	1
14244	Benzo(a)pyrene	50-32-8	0.9	0.01	0.05	1
14244	Benzo(b)fluoranthene	205-99-2	1	0.01	0.05	1
14244	Benzo(k)fluoranthene	207-08-9	0.9	0.01	0.05	1
14244	Chrysene	218-01-9	0.9	0.01	0.05	1
14244	Dibenz(a,h)anthracene	53-70-3	1	0.02	0.07	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	1	0.01	0.05	1
<b>GC Volatiles</b>		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	1,500	19	250	1
<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	18	0.03	1.0	1
<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	230	45	100	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	250	1

### Sample Comments

State of Washington Lab Certification No. C457  
Carcinogenic PAHs have been reported for this sample.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	19039WAS026	02/16/2019 12:39	Edward C Monborne	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	19039WAS026	02/11/2019 08:30	Logan M Brosemer	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	19042A94A	02/11/2019 22:48	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	19042A94A	02/11/2019 21:57	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	19042A94A	02/11/2019 21:56	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	2	19042A94A	02/11/2019 22:47	Jeremy C Giffin	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	190440026A	02/17/2019 13:01	Heather E Williams	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	190440026A	02/14/2019 08:00	Joshua S Ruth	1

\*=This limit was used in the evaluation of the final result

**Sample Description:** MW-129R-W-190207 MSD Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9982786  
**ELLE Group #:** 2028569  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submittal Date/Time:** 02/08/2019 10:10  
**Collection Date/Time:** 02/07/2019 10:00

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270D SIM</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	
14244	Benzo(a)anthracene	56-55-3	1	0.01	0.05	1
14244	Benzo(a)pyrene	50-32-8	1	0.01	0.05	1
14244	Benzo(b)fluoranthene	205-99-2	1	0.01	0.05	1
14244	Benzo(k)fluoranthene	207-08-9	1	0.01	0.05	1
14244	Chrysene	218-01-9	0.9	0.01	0.05	1
14244	Dibenz(a,h)anthracene	53-70-3	0.9	0.02	0.07	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	0.9	0.01	0.05	1
<b>GC Volatiles</b>		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	1,500	19	250	1
<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	18	0.03	1.0	1
<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	300	46	100	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	260	1

### Sample Comments

State of Washington Lab Certification No. C457  
Carcinogenic PAHs have been reported for this sample.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	19039WAS026	02/16/2019 13:06	Edward C Monborne	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	19039WAS026	02/11/2019 08:30	Logan M Brosemer	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	19042A94A	02/11/2019 23:14	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	19042A94A	02/11/2019 22:22	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	19042A94A	02/11/2019 22:21	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	2	19042A94A	02/11/2019 23:13	Jeremy C Giffin	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	190440026A	02/17/2019 13:24	Heather E Williams	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx modified	1	190440026A	02/14/2019 08:00	Joshua S Ruth	1

\*=This limit was used in the evaluation of the final result

**Sample Description:** MW-518-W-190207 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9982787  
**ELLE Group #:** 2028569  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submittal Date/Time:** 02/08/2019 10:10  
**Collection Date/Time:** 02/07/2019 11:45

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
<b>GC/MS Semivolatiles</b>			<b>SW-846 8270D SIM</b>	<b>ug/l</b>	<b>ug/l</b>	
14244	Benzo(a)anthracene	56-55-3	N.D.	0.01	0.05	1
14244	Benzo(a)pyrene	50-32-8	N.D.	0.01	0.05	1
14244	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	0.05	1
14244	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	0.05	1
14244	Chrysene	218-01-9	N.D.	0.01	0.05	1
14244	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	0.07	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	0.05	1

The recovery for the sample surrogate(s) is outside the QC acceptance limits as noted on the QC Summary. Since the recovery is high and no target analytes were detected, the data is reported.

<b>GC Volatiles</b>			<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	340	19	250	1

<b>GC Volatiles</b>			<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.03	1.0	1

<b>GC Petroleum Hydrocarbons w/Si</b>			<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	N.D.	46	100	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	260	1

### Sample Comments

State of Washington Lab Certification No. C457  
Carcinogenic PAHs have been reported for this sample.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	19039WAS026	02/16/2019 13:33	Edward C Monborne	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	19039WAS026	02/11/2019 08:30	Logan M Brosemer	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	19042A94A	02/12/2019 00:31	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	19042A94A	02/12/2019 00:31	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	19042A94A	02/12/2019 00:30	Jeremy C Giffin	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	190440026A	02/17/2019 13:48	Heather E Williams	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	190440026A	02/14/2019 08:00	Joshua S Ruth	1

\*=This limit was used in the evaluation of the final result

**Sample Description:** MW-526-W-190207 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9982788  
**ELLE Group #:** 2028569  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 02/08/2019 10:10  
**Collection Date/Time:** 02/07/2019 11:00

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270D SIM</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	
14244	Benzo(a)anthracene	56-55-3	N.D.	0.01	0.05	1
14244	Benzo(a)pyrene	50-32-8	N.D.	0.01	0.05	1
14244	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	0.05	1
14244	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	0.05	1
14244	Chrysene	218-01-9	N.D.	0.01	0.05	1
14244	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	0.07	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	0.05	1
<b>GC Volatiles</b>		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	360	19	250	1
<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	0.06 J	0.03	1.0	1
<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	100	47	100	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	260	1

The surrogate data is outside the QC limits due to unresolvable matrix problems evident in the sample chromatogram.

### Sample Comments

State of Washington Lab Certification No. C457  
Carcinogenic PAHs have been reported for this sample.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	19039WAS026	02/16/2019 13:59	Edward C Monborne	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	19039WAS026	02/11/2019 08:30	Logan M Brosemer	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	19042A94A	02/12/2019 00:56	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	19042A94A	02/12/2019 00:56	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	19042A94A	02/12/2019 00:55	Jeremy C Giffin	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	190440026A	02/17/2019 14:11	Heather E Williams	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	190440026A	02/14/2019 08:00	Joshua S Ruth	1

\*=This limit was used in the evaluation of the final result

**Sample Description:** MW-E-R-W-190207 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9982789  
**ELLE Group #:** 2028569  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 02/08/2019 10:10  
**Collection Date/Time:** 02/07/2019 09:50

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270D SIM</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	
14244	Benzo(a)anthracene	56-55-3	N.D.	0.01	0.05	1
14244	Benzo(a)pyrene	50-32-8	N.D.	0.01	0.05	1
14244	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	0.05	1
14244	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	0.05	1
14244	Chrysene	218-01-9	N.D.	0.01	0.05	1
14244	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	0.07	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	0.05	1
<b>GC Volatiles</b>		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	350	19	250	1
<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	0.2 J	0.03	1.0	1
<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	450	46	100	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	260	1

### Sample Comments

State of Washington Lab Certification No. C457  
Carcinogenic PAHs have been reported for this sample.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	19039WAS026	02/16/2019 14:26	Edward C Monborne	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	19039WAS026	02/11/2019 08:30	Logan M Brosemer	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	19042A94A	02/12/2019 01:22	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	19042A94A	02/12/2019 01:22	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	19042A94A	02/12/2019 01:21	Jeremy C Giffin	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	190440026A	02/17/2019 14:34	Heather E Williams	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	190440026A	02/14/2019 08:00	Joshua S Ruth	1

\*=This limit was used in the evaluation of the final result

**Sample Description:** DUP-1-WD-190207 Grab Groundwater  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9982790  
**ELLE Group #:** 2028569  
**Matrix:** Groundwater

**Project Name:** Edmonds Terminal

**Submission Date/Time:** 02/08/2019 10:10  
**Collection Date/Time:** 02/07/2019

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
<b>GC/MS Semivolatiles</b>		<b>SW-846 8270D SIM</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	
14244	Benzo(a)anthracene	56-55-3	N.D.	0.01	0.05	1
14244	Benzo(a)pyrene	50-32-8	N.D.	0.01	0.05	1
14244	Benzo(b)fluoranthene	205-99-2	N.D.	0.01	0.05	1
14244	Benzo(k)fluoranthene	207-08-9	N.D.	0.01	0.05	1
14244	Chrysene	218-01-9	N.D.	0.01	0.05	1
14244	Dibenz(a,h)anthracene	53-70-3	N.D.	0.02	0.07	1
14244	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.01	0.05	1
<b>GC Volatiles</b>		<b>ECY 97-602 NWTPH-Gx</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	380	19	250	1
<b>GC Volatiles</b>		<b>SW-846 8021B</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	0.2 J	0.03	1.0	1
<b>GC Petroleum Hydrocarbons w/Si</b>		<b>ECY 97-602 NWTPH-Dx modified</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	
12917	DX DRO C12-C24 w/ SiGel	n.a.	300	47	100	1
12917	DX HRO C24-C40 w/ SiGel	n.a.	N.D.	100	260	1

### Sample Comments

State of Washington Lab Certification No. C457  
Carcinogenic PAHs have been reported for this sample.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
14244	SIM SVOAs 8270D MINI	SW-846 8270D SIM	1	19039WAS026	02/16/2019 14:53	Edward C Monborne	1
10466	BNA Water Extraction SIM	SW-846 3510C	1	19039WAS026	02/11/2019 08:30	Logan M Brosemer	1
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	19042A94A	02/12/2019 01:48	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	19042A94A	02/12/2019 01:48	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	19042A94A	02/12/2019 01:47	Jeremy C Giffin	1
12917	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	190440026A	02/17/2019 14:57	Heather E Williams	1
12924	Mini-Ext. DRO DX, Column SiGel	ECY 97-602 NWTPH-Dx 06/97	1	190440026A	02/14/2019 08:00	Joshua S Ruth	1

\*=This limit was used in the evaluation of the final result

**Sample Description:** QA-T-190207 NA Water  
Unocal Edmonds Terminal  
11720 Unoco Road - Edmonds, WA

**Chevron Environmental Mgmt Co**  
**ELLE Sample #:** WW 9982791  
**ELLE Group #:** 2028569  
**Matrix:** Water

**Project Name:** Edmonds Terminal

**Submittal Date/Time:** 02/08/2019 10:10  
**Collection Date/Time:** 02/07/2019

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
<b>GC Volatiles</b>						
	<b>ECY 97-602 NWTPH-Gx</b>		<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	
08274	NWTPH-Gx water C7-C12	n.a.	N.D.	19	250	1
<b>GC Volatiles</b>						
	<b>SW-846 8021B</b>		<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	
02102	Benzene	71-43-2	N.D.	0.03	1.0	1

### Sample Comments

State of Washington Lab Certification No. C457

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
08274	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	19042A94A	02/11/2019 20:41	Jeremy C Giffin	1
02102	Method 8021 Water Master	SW-846 8021B	1	19042A94A	02/11/2019 20:41	Jeremy C Giffin	1
01146	GC VOA Water Prep	SW-846 5030B	1	19042A94A	02/11/2019 20:40	Jeremy C Giffin	1

\*=This limit was used in the evaluation of the final result

## Quality Control Summary

Client Name: Chevron Environmental Mgmt Co  
Reported: 02/18/2019 17:34

Group Number: 2028569

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

### Method Blank

Analysis Name	Result	MDL**	LOQ
	ug/l	ug/l	ug/l
Batch number: 19039WAS026	Sample number(s): 9982783-9982790		
Benzo(a)anthracene	N.D.	0.01	0.05
Benzo(a)pyrene	N.D.	0.01	0.05
Benzo(b)fluoranthene	N.D.	0.01	0.05
Benzo(k)fluoranthene	N.D.	0.01	0.05
Chrysene	N.D.	0.01	0.05
Dibenz(a,h)anthracene	N.D.	0.02	0.07
Indeno(1,2,3-cd)pyrene	0.01 J	0.01	0.05
Batch number: 19042A94A	Sample number(s): 9982783-9982791		
Benzene	N.D.	0.03	1.0
NWTPH-Gx water C7-C12	N.D.	19	250
Batch number: 190440026A	Sample number(s): 9982783-9982790		
DX DRO C12-C24 w/ SiGel	N.D.	45	100
DX HRO C24-C40 w/ SiGel	N.D.	100	250

### LCS/LCSD

Analysis Name	LCS Spike Added	LCS Conc	LCSD Spike Added	LCSD Conc	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
	ug/l	ug/l	ug/l	ug/l					
Batch number: 19039WAS026	Sample number(s): 9982783-9982790								
Benzo(a)anthracene	1.00	0.995			100		59-143		
Benzo(a)pyrene	1.00	1.03			103		63-145		
Benzo(b)fluoranthene	1.00	1.06			106		63-152		
Benzo(k)fluoranthene	1.00	0.970			97		62-143		
Chrysene	1.00	0.904			90		59-135		
Dibenz(a,h)anthracene	1.00	1.16			116		56-145		
Indeno(1,2,3-cd)pyrene	1.00	1.18			118		56-151		
	ug/l	ug/l	ug/l	ug/l					
Batch number: 19042A94A	Sample number(s): 9982783-9982791								
Benzene	20	18.42			92		80-120		
NWTPH-Gx water C7-C12	1100	1366.29			124		64-131		
	ug/l	ug/l	ug/l	ug/l					

\*- Outside of specification

\*\* - This limit was used in the evaluation of the final result for the blank

(1) The result for one or both determinations was less than five times the LOQ.

(2) The unspiked result was more than four times the spike added.



## Quality Control Summary

Client Name: Chevron Environmental Mgmt Co  
Reported: 02/18/2019 17:34

Group Number: 2028569

### LCS/LCSD (continued)

Analysis Name	LCS Spike Added ug/l	LCS Conc ug/l	LCSD Spike Added ug/l	LCSD Conc ug/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: 190440026A DX DRO C12-C24 w/ SiGel	Sample number(s): 9982783-9982790								
	600.14	213.79			36		10-115		

### MS/MSD

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc ug/l	MS Spike Added ug/l	MS Conc ug/l	MSD Spike Added ug/l	MSD Conc ug/l	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Batch number: 19039WAS026	Sample number(s): 9982783-9982790 UNSPK: 9982784									
Benzo(a)anthracene	N.D.	1.02	1.06	1.01	1.02	104	101	59-143	4	30
Benzo(a)pyrene	N.D.	1.02	0.946	1.01	0.992	93	98	63-145	5	30
Benzo(b)fluoranthene	N.D.	1.02	0.995	1.01	1.08	98	107	63-152	8	30
Benzo(k)fluoranthene	N.D.	1.02	0.914	1.01	0.975	90	96	62-143	7	30
Chrysene	N.D.	1.02	0.914	1.01	0.897	90	89	59-135	2	30
Dibenz(a,h)anthracene	N.D.	1.02	1.22	1.01	0.869	120	86	56-145	34*	30
Indeno(1,2,3-cd)pyrene	N.D.	1.02	1.31	1.01	0.938	129	93	56-151	33*	30
	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>					
Batch number: 19042A94A	Sample number(s): 9982783-9982791 UNSPK: 9982784									
Benzene	N.D.	20	18.36	20	18.33	92	92	80-120	0	30
NWTPH-Gx water C7-C12	33.31	1100	1502	1100	1539.45	134*	137*	64-131	2	30
	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>	<b>ug/l</b>					
Batch number: 190440026A	Sample number(s): 9982783-9982790 UNSPK: 9982784									
DX DRO C12-C24 w/ SiGel	45.63	604.98	231.79	619.98	296.89	31	41	30-115	25*	20

### Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: SIM SVOAs 8270D MINI  
Batch number: 19039WAS026

	Fluoranthene-d10	Benzo(a)pyrene-d12	1-Methylnaphthalene-d10
9982783	92	75	82
9982784	68	79	94
9982785	81	82	91

\*- Outside of specification

\*\* - This limit was used in the evaluation of the final result for the blank

(1) The result for one or both determinations was less than five times the LOQ.

(2) The unspiked result was more than four times the spike added.

## Quality Control Summary

Client Name: Chevron Environmental Mgmt Co  
Reported: 02/18/2019 17:34

Group Number: 2028569

### Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: SIM SVOAs 8270D MINI

Batch number: 19039WAS026

	Fluoranthene-d10	Benzo(a)pyrene-d12	1-Methylnaphthalene-d10
9982786	72	86	91
9982787	85	55	127*
9982788	103	61	112
9982789	68	83	101
9982790	86	88	103
Blank	82	75	74
LCS	98	91	89
MS	81	82	91
MSD	72	86	91
Limits:	40-132	18-129	33-122

Analysis Name: Method 8021 Water Master

Batch number: 19042A94A

	Trifluorotoluene-P	Trifluorotoluene-F
9982783	79	79
9982784	79	80
9982785	76	110
9982786	77	108
9982787	77	79
9982788	76	81
9982789	76	94
9982790	78	96
9982791	79	80
Blank	78	81
LCS	77	107
MS	76	110
MSD	77	108
Limits:	51-120	50-150

Analysis Name: NWTPH-Dx water w/Si Gel

Batch number: 190440026A

	Orthoterphenyl	Capric Acid
9982783	59	0
9982784	51	0
9982785	53	0
9982786	66	0
9982787	55	0
9982788	39*	0
9982789	73	0
9982790	75	0

\*- Outside of specification

\*\* - This limit was used in the evaluation of the final result for the blank

(1) The result for one or both determinations was less than five times the LOQ.

(2) The unspiked result was more than four times the spike added.

## Quality Control Summary

Client Name: Chevron Environmental Mgmt Co  
Reported: 02/18/2019 17:34

Group Number: 2028569

### Surrogate Quality Control (continued)

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: NWTPH-Dx water w/Si Gel  
Batch number: 190440026A

	Orthoterphenyl	Capric Acid
Blank	54	0
LCS	57	0
MS	53	0
MSD	66	0
Limits:	50-150	0-1

\*- Outside of specification

\*\* - This limit was used in the evaluation of the final result for the blank

(1) The result for one or both determinations was less than five times the LOQ.

(2) The unspiked result was more than four times the spike added.

# Chevron Northwest Region Analysis Request/Chain of Custody



**Lancaster Laboratories  
Environmental**

Acct. # 11964

For Eurofins Lancaster Laboratories Environmental use only  
Group # 203564 Sample # 4482783-91  
Instructions on reverse side correspond with circled numbers.

1 Client Information			4 Matrix			5 Analyses Requested										SCR #: _____							
Facility # <u>Edmonds Terminal</u>		WBS <u>NWENJPMGDD1430302</u>	<input type="checkbox"/> Sediment <input checked="" type="checkbox"/> Ground <input type="checkbox"/> Surface  <input type="checkbox"/> Potable <input type="checkbox"/> NPDES <input type="checkbox"/> Air	<input type="checkbox"/> Soil  <input type="checkbox"/> Water  <input type="checkbox"/> Oil	Total Number of Containers BTEX+MTBE <input checked="" type="checkbox"/> 80218 <input type="checkbox"/> 8260 8260 full scan  Oxygenates  NWTPH-Gx  NWTPH-Dx with Silica Gel Cleanup <input checked="" type="checkbox"/> NWTPH-Dx without Silica Gel Cleanup <input type="checkbox"/> WA VPH <input type="checkbox"/> WA EPH <input type="checkbox"/> Lead <input type="checkbox"/> Total <input type="checkbox"/> Diss. <input type="checkbox"/> Method EPAHS by USEPA 8270 SIM											<input type="checkbox"/> Results in Dry Weight <input type="checkbox"/> J value reporting needed <input type="checkbox"/> Must meet lowest detection limits possible for 8260 compounds <input type="checkbox"/> 8021 MTBE Confirmation <input type="checkbox"/> Confirm MTBE + Naphthalene <input type="checkbox"/> Confirm highest hit by 8260 <input type="checkbox"/> Confirm all hits by 8260 <input type="checkbox"/> Run _____ oxy's on highest hit <input type="checkbox"/> Run _____ oxy's on all hits							
Site Address <u>11720 unoco Rd, Edmonds, WA</u>																							
Chevron PM <u>Kim Joltz</u>		Lead Consultant <u>Arceadis</u>																					
Consultant/Office <u>1100 Olive way, suite 800, Seattle, WA 98101</u>																							
Consultant Project Mgr. <u>Samuel Miles</u>																							
Consultant Phone # _____													6 <b>Remarks</b>  * use standard Silica Gel cleanup * 5 Day TAT on All samples										
Sampler <u>Eric Krueger, Kelsey Franz</u>																							
2 Sample Identification		Collected		3 Grab	Composite																		
		Date	Time																				
<u>MW-101</u>		<u>2/7/19</u>	<u>1150</u>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		
<u>MW-129R</u>			<u>1000</u>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		
<u>MW-129R MS/MSD</u>			<u>1000</u>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		
<u>MW-518</u>			<u>1145</u>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		
<u>MW-526</u>			<u>1100</u>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		
<u>MW-E-R</u>			<u>0950</u>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		
<u>DUP-1</u>		↓		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>			
<u>Trip Blank</u>		—		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>			
7 <b>Turnaround Time Requested (TAT)</b> (please circle)			Relinquished by <u>[Signature]</u>			Date <u>2/7/19</u>	Time <u>1500</u>	Received by <u>FedEx</u>			Date <u>2/7/19</u>	Time <u>1500</u>	9										
Standard <input type="checkbox"/> 5 day <input checked="" type="checkbox"/> 4 day <input type="checkbox"/> 72 hour <input type="checkbox"/> 48 hour <input type="checkbox"/> 24 hour <input type="checkbox"/>			Relinquished by _____			Date _____	Time _____	Received by _____			Date _____	Time _____											
8 <b>Data Package</b> (circle if required)			Relinquished by Commercial Carrier:			Received by			Date	Time													
Type I - Full <input type="checkbox"/>			CVX-RTBU-FL_05 (default)			UPS _____ FedEx <input checked="" type="checkbox"/> Other _____			<u>[Signature]</u>			<u>2/8/19</u>	<u>1010</u>										
Type VI (Raw Data) <input type="checkbox"/>			Other: _____			Temperature Upon Receipt <u>0.6/1.3 °C</u>			Custody Seals Intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No														



Client: Chevron c/o Arcadis

**Delivery and Receipt Information**

Delivery Method: Fed Ex                      Arrival Timestamp: 02/08/2019 10:10  
 Number of Packages: 2                              Number of Projects: 1

**Arrival Condition Summary**

Shipping Container Sealed:	Yes	Sample IDs on COC match Containers:	Yes
Custody Seal Present:	Yes	Sample Date/Times match COC:	Yes
Custody Seal Intact:	Yes	VOA Vial Headspace ≥ 6mm:	No
Samples Chilled:	Yes	Total Trip Blank Qty:	2
Paperwork Enclosed:	Yes	Trip Blank Type:	HCl
Samples Intact:	Yes	Air Quality Samples Present:	No
Missing Samples:	No		
Extra Samples:	No		
Discrepancy in Container Qty on COC:	No		

*Unpacked by Nicole Reiff (25684) at 12:38 on 02/08/2019*

**Samples Chilled Details**

Thermometer Types:    *DT = Digital (Temp. Bottle)    IR = Infrared (Surface Temp)*    All Temperatures in °C.

Cooler #	Thermometer ID	Corrected Temp	Therm. Type	Ice Type	Ice Present?	Ice Container	Elevated Temp?
1	DT146	0.6	DT	Wet	Y	Bagged	N
2	DT146	1.3	DT	Wet	Y	Bagged	N

# Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

<b>BMQL</b>	Below Minimum Quantitation Level	<b>mL</b>	milliliter(s)
<b>C</b>	degrees Celsius	<b>MPN</b>	Most Probable Number
<b>cfu</b>	colony forming units	<b>N.D.</b>	non-detect
<b>CP Units</b>	cobalt-chloroplatinate units	<b>ng</b>	nanogram(s)
<b>F</b>	degrees Fahrenheit	<b>NTU</b>	nephelometric turbidity units
<b>g</b>	gram(s)	<b>pg/L</b>	picogram/liter
<b>IU</b>	International Units	<b>RL</b>	Reporting Limit
<b>kg</b>	kilogram(s)	<b>TNTC</b>	Too Numerous To Count
<b>L</b>	liter(s)	<b>µg</b>	microgram(s)
<b>lb.</b>	pound(s)	<b>µL</b>	microliter(s)
<b>m3</b>	cubic meter(s)	<b>umhos/cm</b>	micromhos/cm
<b>meq</b>	milliequivalents	<b>MCL</b>	Maximum Contamination Limit
<b>mg</b>	milligram(s)		
<b>&lt;</b>	less than		
<b>&gt;</b>	greater than		
<b>ppm</b>	parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.		
<b>ppb</b>	parts per billion		
<b>Dry weight basis</b>	Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.		

**Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.**

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

This report shall not be reproduced except in full, without the written approval of the laboratory.

Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as "analyze immediately" are not performed within 15 minutes.

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# Data Qualifiers

Qualifier	Definition
C	Result confirmed by reanalysis
D1	Indicates for dual column analyses that the result is reported from column 1
D2	Indicates for dual column analyses that the result is reported from column 2
E	Concentration exceeds the calibration range
K1	Initial Calibration Blank is above the QC limit and the sample result is ND
K2	Continuing Calibration Blank is above the QC limit and the sample result is ND
K3	Initial Calibration Verification is above the QC limit and the sample result is ND
K4	Continuing Calibration Verification is above the QC limit and the sample result is ND
J (or G, I, X)	Estimated value $\geq$ the Method Detection Limit (MDL or DL) and $<$ the Limit of Quantitation (LOQ or RL)
P	Concentration difference between the primary and confirmation column $>40\%$ . The lower result is reported.
P^	Concentration difference between the primary and confirmation column $> 40\%$ . The higher result is reported.
U	Analyte was not detected at the value indicated
V	Concentration difference between the primary and confirmation column $>100\%$ . The reporting limit is raised due to this disparity and evident interference.
W	The dissolved oxygen uptake for the unseeded blank is greater than 0.20 mg/L.
Z	Laboratory Defined - see analysis report

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods. Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.

# APPENDIX E

## Groundwater Analytical Data Validation Memorandums





# Data Validation Memorandum

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<b>TO:</b>	Ophélie Encelle	<b>SDG:</b>	1921956
<b>FROM:</b>	Dilip Kumar	<b>SITE:</b>	Former Unocal Edmonds Bulk Fuel Terminal Edmonds, Washington
<b>DATE:</b>	April 12, 2018		

## INTRODUCTION

This report was prepared by Arcadis Consulting India Pvt Ltd for Arcadis U.S., Inc. (Arcadis) to provide a data validation of the analytical results for the groundwater samples collected at the former Union Oil Company of California Edmonds Bulk Fuel Terminal, located at 11720 Unoco Road, Edmonds, Washington (Site). Groundwater samples are collected and submitted to a Washington State Department of Ecology (Ecology) approved laboratory, Lancaster Laboratories Environmental.

Particularly, this report summarizes the level II data validation findings of the analytical results reported in the sample delivery group (SDG) 1921956 for 16 groundwater samples, 1 field duplicate and 1 trip blank collected on March 20, 2018. Matrix spike/matrix spike duplicate (MS/MSD) was requested for 1 groundwater sample. The samples for analysis and qualified results are listed in Table 1 and Table 2. The data were reviewed in accordance with United States Environmental Protection Agency (USEPA, 2017), National Functional Guidelines for Superfund Organic Methods Data Review.

According to the July 2017 compliance monitoring plan (CMP), groundwater samples are submitted to an Ecology-approved laboratory under a chain-of-custody and analyzed in accordance with following methods:

- Quarterly for:
  - Benzene by USEPA Method 8021B
  - Gasoline range organics (GRO) by Ecology Method NWTPH-Gx
  - Diesel range organics (DRO) and heavy-oil range organics (HO) by Ecology Method NWTPH-Dx (after silica gel cleanup)
  - Carcinogenic polyaromatic hydrocarbons (cPAHs) by USEPA Method 8270 SIM
- Biannually for:
  - Sulfate and nitrate by USEPA Method 300.0
  - Dissolved methane by USEPA Method RSK 175
  - Dissolved manganese by USEPA Method 200.8 (field filtered)
  - Ferrous iron (Hach field kit).

## DATA VALIDATION

The analytical data were reviewed to evaluate the usability of the data. The data validation process includes the following category:

- Data Completeness

- Holding Times and Preservation
- Blanks
- Deuterated Monitoring Compounds (Surrogates)
- Laboratory Control Samples/Laboratory Control Samples Duplicate (LCS/LCSD)
- Matrix Spike/Matrix Spike Duplicates (MS/MSD)
- Field Duplicates (FD)
- Laboratory Duplicates/Replicates (LR)

Groundwater samples were analyzed for benzene (USEPA method 8021B), GRO (Ecology method NWTPH-Gx), DRO/HO (Ecology method NWTPH-Dx after silica gel cleanup) and cPAHs (USEPA method 8270C SIM).

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer.

The data review process performed involved evaluating the following parameters: sample receipt, case narrative, holding times, method blank results, trip blank results, LCS/LCSD results, MS/MSD results, field duplicate results and surrogate recoveries.

Each category is further described in the following sections.

### Data Completeness

Groundwater sample analyses were performed as requested on chain-of-custody documentation. The laboratory reported all requested water sample analyses and the deliverable data reports were complete.

### Holding Times and Preservation

All analyses were performed within the method-specified holding time. In addition, all samples were collected and preserved appropriately.

Holding time exceedance presented in the following table:

Method	Holding Time	Date Sampled	Date of Analysis	Exceedance
NE	NE	NE	NE	NE

Note:

NE: not encountered

### Blanks

Quality assurance (QA) blanks (i.e., method and field blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Laboratory method blanks measure laboratory contamination. Rinsate blanks measure contamination of samples during field operations by non-dedicated sampling equipment. Trip blanks measure contamination of samples during samples transportation.

#### Laboratory Method Blanks

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank (common laboratory contaminant compounds are calculated at ten times) is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

A method blank was analyzed for each method. No method blank contamination was detected.

Field sample ID qualified for blank contamination summarized in the following table:

Field Sample ID	Blank type	Method	Parameter	Unit	Blank Result	Sample Result	Validation Qualifier
NE	NE	NE	NE	NE	NE	NE	NE

#### *Rinsate Blank*

No rinsate blank is required since the equipment is dedicated to the sampling.

#### *Trip blank*

No detections were observed in the trip blank therefore no sample contamination is suspected during sample transportation and results are meeting QA requirements.

### Deuterated Monitoring Compounds (Surrogates)

Appropriate numbers of surrogate compounds were spiked into each sample for the USEPA method 8021B, USEPA method 8270C SIM, Ecology NWTPH-Gx and Ecology NWTPH-Dx. All surrogate compound recoveries were within the laboratory's acceptance criteria except.

Field Sample IDs associated with surrogates exhibiting outside of control limits presented in the following table:

Field Sample ID	Surrogates	Recovery	Laboratory Limit
NE	NE	NE	NE

### Laboratory Control Sample/ Laboratory Control Sample Duplicates

LCSs were prepared in duplicate and analyzed. LCS and LCSD recoveries reported and the relative percent differences (RPDs) between the LCS and LCSD recoveries were within the laboratory's acceptance criteria besides for DRO in batch 180890022A. The RPD was above the acceptance criteria, therefore the associated detected sample result was qualified as "J".

Samples associated with LCS/LCSD exhibited recoveries outside the control limit presented in the following table:

Field Sample ID	Parameter	LCS Recovery	LCSD Recovery	RPD	RPD Limit	Validation Qualifier
MW-129R-W-180320	DRO	30	103	110	20	J

Notes:

DRO: diesel range organic

J: result is an estimated value

### Matrix spike/Matrix spike duplicates

Matrix spikes were prepared in duplicate and analyzed. MS and MSD analysis must exhibit a percent recoveries and relative percent differences within the laboratory's acceptance criteria.

The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where compound concentration detected in the parent sample exceeds the MS/MSD concentration by factor four.

MS/MSD was performed using sample MW-532-W-180320 and results were observed within acceptance criteria besides for GRO. The MS/MSD recoveries for GRO were observed 21%/17% recoveries high bias compared to the acceptance criteria. The associated sample results were not detected, therefore associated sample result was not qualified.

## Field Duplicates

Field duplicate was collected using sample MW-535-W-180320 and all precision criteria were met and acceptable for SDG 1921956.

## Laboratory Duplicates

Laboratory duplicate was not performed for SDG 1921956.

## CONCLUSION

The objective of this validation memorandum is to demonstrate that sufficient number of representative samples were collected, and the resulting analytical data were acceptable according to the USEPA guidelines and the CMP requirements.

- Precision of the data was verified through the review of field and laboratory data quality indicators that include LCS/LCSD, MS/MSD and FD RPDs. One sample result for LCS/LCSD RPD exceedance was qualified. Precision was acceptable.
- Accuracy of the data was verified through the review of surrogate, LCS and MS recoveries. Accuracy was acceptable.
- Representativeness of the data was verified through the sample collection, storage and preservation procedures, verification of holding time compliance and evaluation of blank data. The laboratory did not note any discrepancies with sample collection, storage or preservation procedures. All data were reported from analyses within the recommended holding time. The method blank and trip blank samples were free of contamination with no qualification required.
- Comparability of the data was ensured through the use of standard analytical procedures and standard units for reporting. Results obtained are comparable to industry standards in that the collection and analytical techniques followed approved, documented procedures.
- Completeness is a measure of the number of valid measurements obtained in relation to the total number of measurements planned. Completeness is expressed as the percentage of valid or usable measurements compared to planned measurements. Valid data are defined as all data that are not rejected for project use. All data were considered valid. The completeness goal was met for all analytes.

## REFERENCES

Arcadis. 2017. Final Compliance Monitoring Plan. Former Unocal Edmonds Bulk Fuel Terminal. July 31.

USEPA 2017. National Functional Guidelines for Superfund Organic Methods Data Review (USEPA-540-R-2017-002). January.

## ATTACHMENTS

Table 1: Sample Summary

Table 2: Qualified Results Summary

**Table 1: Sample Summary**

<b>Field Sample ID</b>	<b>Laboratory Sample ID</b>	<b>Sample Date</b>	<b>Sample Time</b>	<b>Sample Purpose</b>
LM-2-W-180320	9515647	03/20/2018	14:25	Regular
MW-8R-W-180320	9515648	03/20/2018	10:42	Regular
MW-104-W-180320	9515649	03/20/2018	10:05	Regular
MW-129R-W-180320	9515650	03/20/2018	16:12	Regular
MW-520-W-180320	9515651	03/20/2018	09:30	Regular
MW-521-W-180320	9515652	03/20/2018	09:50	Regular
MW-522-W-180320	9515653	03/20/2018	10:55	Regular
MW-525-W-180320	9515654	03/20/2018	12:10	Regular
MW-526-W-180320	9515655	03/20/2018	13:40	Regular
MW-530-W-180320	9515656	03/20/2018	14:18	Regular
MW-531-W-180320	9515657	03/20/2018	12:50	Regular
MW-532-W-180320	9515658	03/20/2018	11:15	Regular
MW-532-W-180320	9515659	03/20/2018	11:15	Matrix Spike
MW-532-W-180320	9515660	03/20/2018	11:15	Matrix Spike Duplicate
MW-533-W-180320	9515661	03/20/2018	11:48	Regular
MW-534-W-180320	9515662	03/20/2018	15:55	Regular
MW-535-W-180320	9515663	03/20/2018	11:45	Regular
DUP-1-W-180320	9515664	03/20/2018	NA	Field Duplicate
QA-T-180320	9515665	03/20/2018	NA	Trip Blank
MW-E-R-W-180320	9515666	03/20/2018	14:05	Regular

Note:  
NA: not applicable

**Table 2: Qualified Results Summary**

Laboratory Sample ID	Field Sample ID	Sample Purpose	SDG	Analytical Method	Parameter	Laboratory Result	Unit	Laboratory Qualifier	Validation Qualifier	Reason Code	Detect Flag
9515650	MW-129R-W-180320	REG	1921956	NWTPH-Dx	DRO	1,900	ug/l		J	LCSP	Y

Notes:

REG: regular

SDG: sample delivery group

DRO: diesel range organics (C12-C24)

J: result is an approximate value

LCSP: laboratory control sample precision outside the control limit

Y: analyte detected

ug/l: micrograms per liter

Ecology method NWTPH-Dx

# Data Validation Memorandum

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<b>TO:</b>	Ophélie Encelle	<b>SDG:</b>	1922345
<b>FROM:</b>	Dilip Kumar	<b>SITE:</b>	Former Unocal Edmonds Bulk Fuel Terminal Edmonds, Washington
<b>DATE:</b>	April 25, 2018		

## INTRODUCTION

This report was prepared by Arcadis Consulting India Pvt Ltd for Arcadis U.S., Inc. (Arcadis) to provide a data validation of the analytical results for the groundwater samples collected at the former Union Oil Company of California Edmonds Bulk Fuel Terminal, located at 11720 Unoco Road, Edmonds, Washington (Site). Groundwater samples are collected and submitted to a Washington State Department of Ecology (Ecology) approved laboratory, Lancaster Laboratories Environmental.

Particularly, this report summarizes the level II data validation findings of the analytical results reported in the sample delivery group (SDG) 1922345 for 15 groundwater samples and 2 field duplicates collected on March 21, 2018. Matrix spike/matrix spike duplicate (MS/MSD) was requested for 1 groundwater sample. The samples for analysis and qualified results are listed in Table 1 and Table 2. The data were reviewed in accordance with United States Environmental Protection Agency (USEPA. 2017), National Functional Guidelines for Superfund Organic Methods Data Review.

According to the July 2017 compliance monitoring plan (CMP), groundwater samples are submitted to an Ecology-approved laboratory under a chain-of-custody and analyzed in accordance with following methods:

- Quarterly for:
  - Benzene by USEPA Method 8021B
  - Gasoline range organics (GRO) by Ecology Method NWTPH-Gx
  - Diesel range organics (DRO) and heavy-oil range organics (HO) by Ecology Method NWTPH-Dx (after silica gel cleanup)
  - Carcinogenic polyaromatic hydrocarbons (cPAHs) by USEPA Method 8270 SIM
- Biannually for:
  - Sulfate and nitrate by USEPA Method 300.0
  - Dissolved methane by USEPA Method RSK 175
  - Dissolved manganese by USEPA Method 200.8 (field filtered)
  - Ferrous iron (Hach field kit).

## DATA VALIDATION

The analytical data were reviewed to evaluate the usability of the data. The data validation process includes the following category:

- Data Completeness

- Holding Times and Preservation
- Blanks
- Deuterated Monitoring Compounds (Surrogates)
- Laboratory Control Samples/Laboratory Control Samples Duplicate (LCS/LCSD)
- Matrix Spike/Matrix Spike Duplicates (MS/MSD)
- Field Duplicates (FD)
- Laboratory Duplicates/Replicates (LR)

Groundwater samples were analyzed for benzene (USEPA method 8021B), GRO (Ecology method NWTPH-Gx), DRO/HO (Ecology method NWTPH-Dx after silica gel cleanup) and cPAHs (USEPA method 8270C SIM).

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer.

The data review process performed involved evaluating the following parameters: sample receipt, case narrative, holding times, method blank results, LCS/LCSD results, MS/MSD results, field duplicate results and surrogate recoveries.

Each category is further described in the following sections.

### Data Completeness

Groundwater sample analyses were performed as requested on chain-of-custody documentation. The laboratory reported all requested water sample analyses and the deliverable data reports were complete.

### Holding Times and Preservation

All analyses were performed within the method-specified holding time. In addition, all samples were collected and preserved appropriately.

Holding time exceedance presented in the following table:

Method	Holding Time	Date Sampled	Date of Analysis	Exceedance
NE	NE	NE	NE	NE

Note:

NE: not encountered

### Blanks

Quality assurance (QA) blanks (i.e., method and field blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Laboratory method blanks measure laboratory contamination. Rinsate blanks measure contamination of samples during field operations by non-dedicated sampling equipment. Trip blanks measure contamination of samples during samples transportation.

#### Laboratory Method Blanks

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank (common laboratory contaminant compounds are calculated at ten times) is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.



A method blank was analyzed for each method. No method blank contamination was detected.

Field sample ID qualified for blank contamination summarized in the following table:

Field Sample ID	Blank type	Method	Parameter	Unit	Blank Result	Sample Result	Validation Qualifier
NE	NE	NE	NE	NE	NE	NE	NE

#### *Rinsate Blank*

No rinsate blank is required since the equipment is dedicated to the sampling.

#### *Trip blank*

Trip blank was not collected for SDG 1922345.

### Deuterated Monitoring Compounds (Surrogates)

Appropriate numbers of surrogate compounds were spiked into each sample for the USEPA method 8021B, USEPA method 8270C SIM, Ecology NWTPH-Gx and Ecology NWTPH-Dx. All surrogate compound recoveries were within the laboratory's acceptance criteria except.

Field Sample IDs associated with surrogates exhibiting outside of control limits presented in the following table:

Field Sample ID	Surrogates	Recovery	Laboratory Limit
NE	NE	NE	NE

### Laboratory Control Sample/ Laboratory Control Sample Duplicates

LCSs were prepared in duplicate and analyzed. LCS and LCSD recoveries reported and the relative percent differences (RPDs) between the LCS and LCSD recoveries were within the laboratory's acceptance criteria.

Samples associated with LCS/LCSD exhibited recoveries outside the control limit presented in the following table:

Field Sample ID	Parameter	LCS Recovery	LCSD Recovery	RPD	RPD Limit	Validation Qualifier
NE	NE	NE	NE	NE	NE	NE

### Matrix spike/Matrix spike duplicates

Matrix spikes were prepared in duplicate and analyzed. MS and MSD analysis must exhibit a percent recoveries and relative percent differences within the laboratory's acceptance criteria.

The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where compound concentration detected in the parent sample exceeds the MS/MSD concentration by factor four.

MS/MSD was performed using sample MW-516-W-180321 and results were observed within acceptance criteria besides for GRO. The MS/MSD recoveries for GRO were observed 15% recoveries high bias compared to the acceptance criteria. The associated sample result was not detected, therefore associated sample result was not qualified.

### Field Duplicates

Field duplicates DUP-2-W-180321 and DUP-3-W-180321 were collected respectively using sample MW-506-W-180321 and MW-512-180321. All precision criteria were met and acceptable for SDG 1922345.

## Laboratory Duplicates

Laboratory duplicate was not performed for SDG 1922345.

## CONCLUSION

The objective of this validation memorandum is to demonstrate that sufficient number of representative samples were collected, and the resulting analytical data were acceptable according to the USEPA guidelines and the CMP requirements.

- Precision of the data was verified through the review of field and laboratory data quality indicators that include LCS/LCSD, MS/MSD and FD RPDs. Precision was acceptable.
- Accuracy of the data was verified through the review of surrogate, LCS and MS recoveries. Accuracy was acceptable.
- Representativeness of the data was verified through the sample collection, storage and preservation procedures, verification of holding time compliance and evaluation of blank data. The laboratory did not note any discrepancies with sample collection, storage or preservation procedures. All data were reported from analyses within the recommended holding time. The method blank samples were free of contamination with no qualification required.
- Comparability of the data was ensured through the use of standard analytical procedures and standard units for reporting. Results obtained are comparable to industry standards in that the collection and analytical techniques followed approved, documented procedures.
- Completeness is a measure of the number of valid measurements obtained in relation to the total number of measurements planned. Completeness is expressed as the percentage of valid or usable measurements compared to planned measurements. Valid data are defined as all data that are not rejected for project use. All data were considered valid. The completeness goal was met for all analytes.

## REFERENCES

Arcadis. 2017. Final Compliance Monitoring Plan. Former Unocal Edmonds Bulk Fuel Terminal. July 31.

USEPA 2017. National Functional Guidelines for Superfund Organic Methods Data Review (USEPA-540-R-2017-002). January.

## ATTACHMENTS

Table 1: Sample Summary

Table 2: Qualified Results Summary

**Table 1: Sample Summary**

<b>Field Sample ID</b>	<b>Laboratory Sample ID</b>	<b>Sample Date</b>	<b>Sample Time</b>	<b>Sample Purpose</b>
MW-502-W-180321	9517303	03/21/2018	08:55	Regular
MW-503-W-180321	9517304	03/21/2018	10:05	Regular
MW-504-W-180321	9517305	03/21/2018	11:10	Regular
MW-505-W-180321	9517306	03/21/2018	11:25	Regular
MW-506-W-180321	9517307	03/21/2018	10:00	Regular
MW-507-W-180321	9517308	03/21/2018	08:40	Regular
MW-509-W-180321	9517309	03/21/2018	08:45	Regular
MW-511-W-180321	9517310	03/21/2018	13:20	Regular
MW-512-W-180321	9517311	03/21/2018	12:40	Regular
MW-513-W-180321	9517312	03/21/2018	12:45	Regular
MW-514-W-180321	9517313	03/21/2018	14:10	Regular
MW-515-W-180321	9517314	03/21/2018	09:45	Regula
MW-516-W-180321	9517315	03/21/2018	11:00	Regular
MW-516-W-180321	9517316	03/21/2018	11:00	Matrix Spike
MW-516-W-180321	9517317	03/21/2018	11:00	Matrix Spike Duplicate
MW-517-W-180321	9517318	03/21/2018	12:10	Regular
MW-518-W-180321	9517319	03/21/2018	13:05	Regular
DUP-2-W-180321	9517320	03/21/2018	NA	Field Duplicate
DUP-3-W-180321	9517321	03/21/2018	NA	Field Duplicate

Note:  
NA: not applicable



**Table 2: Qualified Results Summary**

Laboratory Sample ID	Field Sample ID	Sample Purpose	SDG	Analytical Method	Parameter	Laboratory Result	Unit	Laboratory Qualifier	Validation Qualifier	Reason Code	Detect Flag
NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE

Notes:

NE: not encountered

SDG: sample delivery group

# Data Validation Memorandum

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<b>TO:</b>	Ophélie Encelle	<b>SDG:</b>	1923075
<b>FROM:</b>	Dilip Kumar	<b>SITE:</b>	Former Unocal Edmonds Bulk Fuel Terminal Edmonds, Washington
<b>DATE:</b>	April 25, 2018		

## INTRODUCTION

This report was prepared by Arcadis Consulting India Pvt Ltd for Arcadis U.S., Inc. (Arcadis) to provide a data validation of the analytical results for the groundwater samples collected at the former Union Oil Company of California Edmonds Bulk Fuel Terminal, located at 11720 Unoco Road, Edmonds, Washington (Site). Groundwater samples are collected and submitted to a Washington State Department of Ecology (Ecology) approved laboratory, Lancaster Laboratories Environmental.

Particularly, this report summarizes the level II data validation findings of the analytical results reported in the sample delivery group (SDG) 1923075 for 6 groundwater samples and 1 field duplicate collected on March 22, 2018. The samples for analysis and qualified results are listed in Table 1 and Table 2. The data were reviewed in accordance with United States Environmental Protection Agency (USEPA. 2017), National Functional Guidelines for Superfund Organic Methods Data Review.

According to the July 2017 compliance monitoring plan (CMP), groundwater samples are submitted to an Ecology-approved laboratory under a chain-of-custody and analyzed in accordance with following methods:

- Quarterly for:
  - Benzene by USEPA Method 8021B
  - Gasoline range organics (GRO) by Ecology Method NWTPH-Gx
  - Diesel range organics (DRO) and heavy-oil range organics (HO) by Ecology Method NWTPH-Dx (after silica gel cleanup)
  - Carcinogenic polyaromatic hydrocarbons (cPAHs) by USEPA Method 8270 SIM
- Biannually for:
  - Sulfate and nitrate by USEPA Method 300.0
  - Dissolved methane by USEPA Method RSK 175
  - Dissolved manganese by USEPA Method 200.8 (field filtered)
  - Ferrous iron (Hach field kit)

## DATA VALIDATION

The analytical data were reviewed to evaluate the usability of the data. The data validation process includes the following category:

- Data Completeness
- Holding Times and Preservation

- Blanks
- Deuterated Monitoring Compounds (Surrogates)
- Laboratory Control Samples/Laboratory Control Samples Duplicate (LCS/LCSD)
- Matrix Spike/Matrix Spike Duplicates (MS/MSD)
- Field Duplicates (FD)
- Laboratory Duplicates/Replicates (LR)

Groundwater samples were analyzed for benzene (USEPA method 8021B), GRO (Ecology method NWTPH-Gx), DRO/HO (Ecology method NWTPH-Dx after silica gel cleanup) and cPAHs (USEPA method 8270C SIM).

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer.

The data review process performed involved evaluating the following parameters: sample receipt, case narrative, holding times, method blank results, LCS/LCSD results, MS/MSD results, field duplicate results and surrogate recoveries.

Each category is further described in the following sections.

### Data Completeness

Groundwater sample analyses were performed as requested on chain-of-custody documentation. The laboratory reported all requested water sample analyses and the deliverable data reports were complete.

### Holding Times and Preservation

All analyses were performed within the method-specified holding time. In addition, all samples were collected and preserved appropriately.

Holding time exceedance presented in the following table:

Method	Holding Time	Date Sampled	Date of Analysis	Exceedance
NE	NE	NE	NE	NE

Note:

NE: not encountered

### Blanks

Quality assurance (QA) blanks (i.e., method and field blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Laboratory method blanks measure laboratory contamination. Rinsate blanks measure contamination of samples during field operations by non-dedicated sampling equipment. Trip blanks measure contamination of samples during samples transportation.

#### Laboratory Method Blanks

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank (common laboratory contaminant compounds are calculated at ten times) is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

A method blank was analyzed for each method. No method blank contamination was detected.

Field sample ID qualified for blank contamination summarized in the following table:

Field Sample ID	Blank type	Method	Parameter	Unit	Blank Result	Sample Result	Validation Qualifier
NE	NE	NE	NE	NE	NE	NE	NE

#### *Rinsate Blank*

No rinsate blank is required since the equipment is dedicated to the sampling.

#### *Trip blank*

Trip blank was not collected for SDG 1923075.

### Deuterated Monitoring Compounds (Surrogates)

Appropriate numbers of surrogate compounds were spiked into each sample for the USEPA method 8021B, USEPA method 8270C SIM, Ecology NWTPH-Gx and Ecology NWTPH-Dx. All surrogate compound recoveries were within the laboratory's acceptance criteria except.

Field Sample IDs associated with surrogates exhibiting outside of control limits presented in the following table:

Field Sample ID	Surrogates	Recovery	Laboratory Limit
NE	NE	NE	NE

### Laboratory Control Sample/ Laboratory Control Sample Duplicates

LCSs were prepared in duplicate and analyzed. LCS and LCSD recoveries reported and the relative percent differences (RPDs) between the LCS and LCSD recoveries were within the laboratory's acceptance criteria.

Samples associated with LCS/LCSD exhibited recoveries outside the control limit presented in the following table:

Field Sample ID	Parameter	LCS Recovery	LCSD Recovery	RPD	RPD Limit	Validation Qualifier
NE	NE	NE	NE	NE	NE	NE

### Matrix spike/Matrix spike duplicates

MS/MSD was not performed using one of the sample collected onsite for SDG 1923075.

### Field Duplicates

Field duplicate was collected using sample MW-519-W-180322 as parent sample and all precision criteria were met and acceptable for SDG 1923075.

### Laboratory Duplicates

Laboratory duplicate was not performed for SDG 1923075.

## CONCLUSION

The objective of this validation memorandum is to demonstrate that sufficient number of representative samples were collected, and the resulting analytical data were acceptable according to the USEPA guidelines and the CMP requirements.

- Precision of the data was verified through the review of field and laboratory data quality indicators that include LCS/LCSD and FD RPDs. Precision was acceptable.

- Accuracy of the data was verified through the review of surrogate and LCS. Accuracy was acceptable.
- Representativeness of the data was verified through the sample collection, storage and preservation procedures, verification of holding time compliance and evaluation of blank data. The laboratory did not note any discrepancies with sample collection, storage or preservation procedures. All data were reported from analyses within the recommended holding time. The method blanks were free of contamination with no qualification required.
- Comparability of the data was ensured through the use of standard analytical procedures and standard units for reporting. Results obtained are comparable to industry standards in that the collection and analytical techniques followed approved, documented procedures.
- Completeness is a measure of the number of valid measurements obtained in relation to the total number of measurements planned. Completeness is expressed as the percentage of valid or usable measurements compared to planned measurements. Valid data are defined as all data that are not rejected for project use. All data were considered valid. The completeness goal was met for all analytes.

## REFERENCES

Arcadis. 2017. Final Compliance Monitoring Plan. Former Unocal Edmonds Bulk Fuel Terminal. July 31.

USEPA 2017. National Functional Guidelines for Superfund Organic Methods Data Review (USEPA-540-R-2017-002). January.

## ATTACHMENTS

Table 1: Sample Summary

Table 2: Qualified Results Summary



**Table 1: Sample Summary**

<b>Field Sample ID</b>	<b>Laboratory Sample ID</b>	<b>Sample Date</b>	<b>Sample Time</b>	<b>Sample Purpose</b>
MW-20R-W-180322	9520769	03/22/2018	11:10	Regular
MW-101-W-180322	9520770	03/22/2018	09:40	Regular
MW-126-W-180322	9520771	03/22/2018	09:55	Regular
MW-139R-W-180322	9520772	03/22/2018	08:45	Regular
MW-143-W-180322	9520773	03/22/2018	09:05	Regular
MW-519-W-180322	9520774	03/22/2018	10:40	Regular
DUP-4-WD-180322	9520775	03/22/2018	NA	Field Duplicate

Note:

NA: not applicable



**Table 2: Qualified Results Summary**

Laboratory Sample ID	Field Sample ID	Sample Purpose	SDG	Analytical Method	Parameter	Laboratory Result	Unit	Laboratory Qualifier	Validation Qualifier	Reason Code	Detect Flag
NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE

Notes:

NE: not encountered

SDG: sample delivery group

# Data Validation Memorandum

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<b>TO:</b>	Ophélie Encelle	<b>SDG:</b>	1960331
<b>FROM:</b>	Dilip Kumar	<b>SITE:</b>	Former Unocal Edmonds Bulk Fuel Terminal Edmonds, Washington
<b>DATE:</b>	November 30, 2018		

## INTRODUCTION

This report was prepared by Arcadis Consulting India Pvt Ltd for Arcadis U.S., Inc. (Arcadis) to provide a data validation of the analytical results for the groundwater samples collected at the former Union Oil Company of California Edmonds Bulk Fuel Terminal, located at 11720 Unoco Road, Edmonds, Washington (Site). Groundwater samples are collected and submitted to a Washington State Department of Ecology (Ecology) approved laboratory, Lancaster Laboratories Environmental.

Particularly, this report summarizes the level II data validation findings of the analytical results reported in the sample delivery group (SDG) 1960331 for 15 groundwater samples, 1 field duplicate and 1 trip blank collected on June 27, 2018. The samples for analysis and qualified results are listed in Table 1 and Table 2. The data were reviewed in accordance with United States Environmental Protection Agency (USEPA. 2017), National Functional Guidelines for Superfund Organic Methods Data Review.

According to the July 2017 compliance monitoring plan (CMP), groundwater samples are submitted to an Ecology-approved laboratory under a chain-of-custody and analyzed in accordance with following methods:

- Quarterly for:
  - Benzene by USEPA Method 8021B
  - Gasoline range organics (GRO) by Ecology Method NWTPH-Gx
  - Diesel range organics (DRO) and heavy-oil range organics (HO) by Ecology Method NWTPH-Dx (after silica gel cleanup)
  - Carcinogenic polyaromatic hydrocarbons (cPAHs) by USEPA Method 8270 SIM
- Biannually for:
  - Sulfate and nitrate by USEPA Method 300.0
  - Dissolved methane by USEPA Method RSK 175
  - Dissolved manganese by USEPA Method 200.8 (field filtered)
  - Ferrous iron (Hach field kit).

## DATA VALIDATION

The analytical data were reviewed to evaluate the usability of the data. The data validation process includes the following category:

- Data Completeness
- Holding Times and Preservation

- Blanks
- Deuterated Monitoring Compounds (Surrogates)
- Laboratory Control Samples/Laboratory Control Samples Duplicate (LCS/LCSD)
- Matrix Spike/Matrix Spike Duplicates (MS/MSD)
- Field Duplicates (FD)
- Laboratory Duplicates/Replicates (LR)

Groundwater samples were analyzed for benzene (USEPA method 8021B), GRO (Ecology method NWTPH-Gx), DRO/HO (Ecology method NWTPH-Dx after silica gel cleanup), cPAHs (USEPA method 8270C SIM), Manganese (USEPA 200.8), Methane (RSK 175), Sulfate and Nitrate Nitrogen (USEPA 300.0).

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer.

The data review process performed involved evaluating the following parameters: sample receipt, case narrative, holding times, method blank results, trip blank results, LCS/LCSD results, MS/MSD results, field and laboratory duplicate results and surrogate recoveries.

Each category is further described in the following sections.

### Data Completeness

Groundwater sample analyses were performed as requested on chain-of-custody documentation. The laboratory reported all requested water sample analyses and the deliverable data reports were complete.

### Holding Times and Preservation

All analyses were performed within the method-specified holding time. In addition, all samples were collected and preserved appropriately.

Holding time exceedance presented in the following table:

Field Sample ID	Method	Holding Time	Date Sampled	Date of Analysis	Exceedance
NE	NE	NE	NE	NE	NE

Note:

NE: not encountered

### Blanks

Quality assurance (QA) blanks (i.e., method and field blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Laboratory method blanks measure laboratory contamination. Rinsate blanks measure contamination of samples during field operations by non-dedicated sampling equipment. Trip blanks measure contamination of samples during samples transportation.

#### Laboratory Method Blanks

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank (common laboratory contaminant compounds are calculated at ten times) is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

A method blank was analyzed for each method. Six of the cPAHs, benzo[a]anthracene benzo[a]pyrene, benzo[b]fluoranthene, benzo[k]fluoranthene, chrysene, and indeno[1,2,3-cd] pyrene, were detected at concentration greater than the MDL in method blank batch 18183WAO026. The associated sample results were non-detect, therefore associated sample results were not qualified.

Field sample ID qualified for blank contamination summarized in the following table:

Field Sample ID	Blank type	Method	Parameter	Unit	Blank Result	Sample Result	Validation Qualifier
NE	NE	NE	NE	NE	NE	NE	NE

#### *Rinsate Blank*

No rinsate blank is required since the equipment is dedicated to the sampling.

#### *Trip blank*

No detections were observed in the trip blank therefore no sample contamination is suspected during sample transportation and results are meeting QA requirements.

### Deuterated Monitoring Compounds (Surrogates)

Appropriate numbers of surrogate compounds were spiked into each sample for the USEPA method 8021B, USEPA method 8270C SIM, Ecology NWTPH-Gx and Ecology NWTPH-Dx. All surrogate compound recoveries were within the laboratory's acceptance criteria except for sample MW-104-W-180627 and MW-526-W-180627 the surrogate recovery for NWTPH-Dx analysis in batch number 181800023A was below the lower control limit (7%/14%) and all associated sample results were qualified as estimated "UJ".

Field Sample IDs associated with surrogates exhibiting outside of control limits presented in the following table:

Field Sample ID	Surrogates	Recovery (%)	Laboratory Limit (%)
MW-530-W-180627	Fluoranthene-d10	38	43-130
MW-104-W-180627	Orthoterphenyl	43	50-150
MW-526-W-180627	Orthoterphenyl	36	50-150

### Laboratory Control Sample/ Laboratory Control Sample Duplicates

LCSs were prepared in duplicate and analyzed. LCS and LCSD recoveries reported and the relative percent differences (RPDs) between the LCS and LCSD recoveries were within the laboratory's acceptance criteria.

Samples associated with LCS/LCSD exhibited recoveries outside the control limit presented in the following table:

Field Sample ID	Parameter	LCS Recovery	LCSD Recovery	RPD	RPD Limit	Validation Qualifier
NE	NE	NE	NE	NE	NE	NE

### Matrix spike/Matrix spike duplicates

Matrix spikes were prepared in duplicate and analyzed. MS and MSD analysis must exhibit a percent recoveries and relative percent differences within the laboratory's acceptance criteria.

The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where compound concentration detected in the parent sample exceeds the MS/MSD concentration by factor four.

MS/MSD was performed using sample MW-104-W-180627 for nitrate nitrogen and sulfate and results were observed within acceptance criteria besides for sulfate. The MS recovery for sulfate was observed 5% recoveries high bias compared to the acceptance criteria. The associated sample results were qualified as J.

MS/MSD was performed using sample MW-511-W-180627 and MW-534-W-180627 for manganese and results were observed within acceptance criteria.

Samples associated with MS/MSD exhibited recoveries outside the control limit presented in the following table:

Field Sample ID	Parameter	MS Recovery	Validation Qualifier	Laboratory Limit
MW-104-W-180627	Sulfate	115	J	90-110

Notes:

J: estimated

### Field Duplicates

Field duplicate was collected for SDG 1960331 and all precision criteria were met except sulfate (29) exhibited RPD greater than 20%. The associated sample results were qualified as J.

Duplicate sample ID and Parent field sample ID were updated in the following table:

Duplicate Sample ID	Field Sample ID
DUP-1-WD-180627	MW-535-W-180627

### Laboratory Duplicates

Laboratory duplicate analysis was done using sample MW-511-W-180627 and MW-534-W-180627 for manganese. All precision criteria were met and acceptable for SDG 1960331.

Laboratory duplicate analysis was done using sample MW-104-W-180627 for nitrate nitrogen and sulfate. All precision criteria were met and acceptable SDG 1960331.

## CONCLUSION

The objective of this validation memorandum is to demonstrate that sufficient number of representative samples were collected, and the resulting analytical data were acceptable according to the USEPA guidelines and the CMP requirements.

- Precision of the data was verified through the review of field and laboratory data quality indicators that include LCS/LCSD, MS/MSD, FD and LR RPDs. One FD result was qualified as estimated for RPD exceedance and the data is considered as valid. Precision was acceptable.
- Accuracy of the data was verified through the review of surrogate, LCS and MS recoveries. One MS result qualified as estimated for high recovery. Two sample results were qualified as estimated for low surrogate recoveries. The data is considered as valid. Accuracy was acceptable.
- Representativeness of the data was verified through the sample collection, storage and preservation procedures, verification of holding time compliance and evaluation of blank data. The laboratory did not note any discrepancies with sample collection, storage or preservation procedures. All data were reported from analyses within the recommended holding time. The method blank and trip blank samples were free of contamination with no qualification required.
- Comparability of the data was ensured through the use of standard analytical procedures and standard units for reporting. Results obtained are comparable to industry standards in that the collection and analytical techniques followed approved, documented procedures.

- Completeness is a measure of the number of valid measurements obtained in relation to the total number of measurements planned. Completeness is expressed as the percentage of valid or usable measurements compared to planned measurements. Valid data are defined as all data that are not rejected for project use. All data were considered valid. The completeness goal was met for all analytes.

## REFERENCES

Arcadis. 2017. Final Compliance Monitoring Plan. Former Unocal Edmonds Bulk Fuel Terminal. July 31.

USEPA 2017. National Functional Guidelines for Superfund Organic Methods Data Review (USEPA-540-R-2017-002). January.

## ATTACHMENTS

Table 1: Sample Summary

Table 2: Qualified Results Summary

**Table 1: Sample Summary**

<b>Field Sample ID</b>	<b>Laboratory Sample ID</b>	<b>Sample Date</b>	<b>Sample Time</b>	<b>Sample Purpose</b>
LM-2-W-180627	9681588	06/27/2018	11:50	Regular
MW-104-W-180627	9681589	06/27/2018	10:55	Regular
MW-129R-W-180627	9681590	06/27/2018	12:25	Regular
MW-E-R-W-180627	9681591	06/27/2018	13:00	Regular
MW-511-W-180627	9681592	06/27/2018	13:30	Regular
MW-525-W-180627	9681593	06/27/2018	09:20	Regular
MW-526-W-180627	9681594	06/27/2018	09:00	Regular
MW-530-W-180627	9681595	06/27/2018	11:55	Regular
MW-531-W-180627	9681596	06/27/2018	09:30	Regular
MW-532-W-180627	9681597	06/27/2018	09:45	Regular
MW-533-W-180627	9681598	06/27/2018	10:00	Regular
MW-534-W-180627	9681599	06/27/2018	13:10	Regular
MW-535-W-180627	9681600	06/27/2018	11:15	Regular
MW-502-W-180627	9681601	06/27/2018	15:00	Regular
MW-519-W-180627	9681602	06/27/2018	14:20	Regular
DUP-1-WD-180627	9681603	06/27/2018	NA	Field Duplicate
Trip_Blank-T-180627	9681604	06/27/2018	NA	Trip Blank

Note:

NA: not applicable



**Table 2: Qualified Results Summary**

Laboratory Sample ID	Field Sample ID	Sample Purpose	SDG	Analytical Method	Parameter	Laboratory Result	Unit	Laboratory Qualifier	Validation Qualifier	Reason Code	Detect Flag
9681589	MW-104-W-180627	REG	1960331	Ecology NWTPH-Dx	DRO	ND	ug/l	--	UJ	SURL	N
9681589	MW-104-W-180627	REG	1960331	Ecology NWTPH-Dx	HRO	ND	ug/l	--	UJ	SURL	N
9681589	MW-104-W-180627	REG	1960331	EPA 300.0	Sulfate	13,000	ug/l	--	J	MSH	Y
9681594	MW-526-W-180627	REG	1960331	Ecology NWTPH-Dx	DRO	ND	ug/l	--	UJ	SURL	N
9681594	MW-526-W-180627	REG	1960331	Ecology NWTPH-Dx	HRO	ND	ug/l	--	UJ	SURL	N
9681600	MW-535-W-180627	REG	1960331	EPA 300.0	Sulfate	29,600	ug/l	--	J	FD	Y
9681603	DUP-1-WD-180627	FD	1960331	EPA 300.0	Sulfate	21,900	ug/l	--	J	FD	Y

Notes:

REG: regular

FD: field duplicate exceeded RPD

SDG: sample delivery group

DRO: diesel range organics reported as DX DRO C12-C24

HRO: Heavy oil range organics reported as DX HRO C24-C40

J: the concentration is an approximate value

UJ: the analyte was analyzed for, but was not detected and the reported quantitation limit is approximate

MSH: MS recovery was above the upper control limit

SURL: surrogate recovery below than lower acceptance limit

ug/L: micrograms per liter

ND: non-detect

N: analyte not detected

Y: analyte detected

# Data Validation Memorandum

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<b>TO:</b>	Ophélie Encelle	<b>SDG:</b>	1961024
<b>FROM:</b>	Dilip Kumar	<b>SITE:</b>	Former Unocal Edmonds Bulk Fuel Terminal Edmonds, Washington
<b>DATE:</b>	November 30, 2018		

## INTRODUCTION

This report was prepared by Arcadis Consulting India Pvt Ltd for Arcadis U.S., Inc. (Arcadis) to provide a data validation of the analytical results for the groundwater samples collected at the former Union Oil Company of California Edmonds Bulk Fuel Terminal, located at 11720 Unoco Road, Edmonds, Washington (Site). Groundwater samples are collected and submitted to a Washington State Department of Ecology (Ecology) approved laboratory, Lancaster Laboratories Environmental.

Particularly, this report summarizes the level II data validation findings of the analytical results reported in the sample delivery group (SDG) 1961024 for 18 groundwater samples, 3 field duplicate and 1 trip blank collected on June 28, 2018. Matrix spike/matrix spike duplicate (MS/MSD) was requested for 1 groundwater sample. The samples for analysis and qualified results are listed in Table 1 and Table 2. The data were reviewed in accordance with United States Environmental Protection Agency (USEPA, 2017), National Functional Guidelines for Superfund Organic Methods Data Review.

According to the July 2017 compliance monitoring plan (CMP), groundwater samples are submitted to an Ecology-approved laboratory under a chain-of-custody and analyzed in accordance with following methods:

- Quarterly for:
  - Benzene by USEPA Method 8021B
  - Gasoline range organics (GRO) by Ecology Method NWTPH-Gx
  - Diesel range organics (DRO) and heavy-oil range organics (HO) by Ecology Method NWTPH-Dx (after silica gel cleanup)
  - Carcinogenic polyaromatic hydrocarbons (cPAHs) by USEPA Method 8270 SIM
- Biannually for:
  - Sulfate and nitrate by USEPA Method 300.0
  - Dissolved methane by USEPA Method RSK 175
  - Dissolved manganese by USEPA Method 200.8 (field filtered)
  - Ferrous iron (Hach field kit).

## DATA VALIDATION

The analytical data were reviewed to evaluate the usability of the data. The data validation process includes the following category:

- Data Completeness

- Holding Times and Preservation
- Blanks
- Deuterated Monitoring Compounds (Surrogates)
- Laboratory Control Samples/Laboratory Control Samples Duplicate (LCS/LCSD)
- Matrix Spike/Matrix Spike Duplicates (MS/MSD)
- Field Duplicates (FD)
- Laboratory Duplicates/Replicates (LR)

Groundwater samples were analyzed for benzene (USEPA method 8021B), GRO (Ecology method NWTPH-Gx), DRO/HO (Ecology method NWTPH-Dx after silica gel cleanup), cPAHs (USEPA method 8270C SIM), Manganese (USEPA 200.8), Methane (RSK 175), Sulfate and Nitrate Nitrogen (USEPA 300.0).

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer.

The data review process performed involved evaluating the following parameters: sample receipt, case narrative, holding times, method blank results, trip blank results, LCS/LCSD results, MS/MSD results, field and laboratory duplicate results and surrogate recoveries.

Each category is further described in the following sections.

### Data Completeness

Groundwater sample analyses were performed as requested on chain-of-custody documentation. The laboratory reported all requested water sample analyses and the deliverable data reports were complete.

### Holding Times and Preservation

All samples were initially analyzed within the specified holding time criteria. Sample DUP-4-WD-180628 was re-extracted past hold time due to LCS recovery outside control limits. See LCS section for validation qualifications. Therefore, initial analysis results were considered and re-extraction analysis were ignored for validation qualifications in sample DUP-4-WD-180628.

Holding time exceedance presented in the following table:

Field Sample ID	Method	Holding Time	Date Sampled	Date of Analysis	Exceedance
NE	NE	NE	NE	NE	NE

Note:

NE: not encountered

### Blanks

Quality assurance (QA) blanks (i.e., method and field blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Laboratory method blanks measure laboratory contamination. Rinsate blanks measure contamination of samples during field operations by non-dedicated sampling equipment. Trip blanks measure contamination of samples during samples transportation.

#### Laboratory Method Blanks

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank (common laboratory contaminant compounds are calculated at ten times) is calculated for QA blanks

containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

A method blank was analyzed for each method. No method blank contamination was detected.

Field sample ID qualified for blank contamination summarized in the following table:

Field Sample ID	Blank type	Method	Parameter	Unit	Blank Result	Sample Result	Validation Qualifier
NE	NE	NE	NE	NE	NE	NE	NE

#### *Rinsate Blank*

No rinsate blank is required since the equipment is dedicated to the sampling.

#### *Trip blank*

No detections were observed in the trip blank therefore no sample contamination is suspected during sample transportation and results are meeting QA requirements.

### Deuterated Monitoring Compounds (Surrogates)

Appropriate numbers of surrogate compounds were spiked into each sample for the USEPA method 8021B, USEPA method 8270C SIM, Ecology NWTPH-Gx and Ecology NWTPH-Dx. All surrogate compound recoveries were within the laboratory's acceptance criteria except for sample MW-513-W-180628. Sample MW-513-W-180628 was re-extracted and re-analysis was performed in batch number 181930005A. However, the LCS analysis was outside the QC acceptance limits in re-analysis. Therefore, re-analysis sample results were not considered for qualification and the surrogate recovery for NWTPH-Dx analysis in initial analysis batch number 181840030A was below the lower control limit (2%) and associated sample result was qualified as estimated "UJ".

Field Sample IDs associated with surrogates exhibiting outside of control limits presented in the following table:

Field Sample ID	Surrogates	Recovery (%)	Laboratory Limit (%)
MW-513-W-180628	Orthoterphenyl	48	50-150

### Laboratory Control Sample/ Laboratory Control Sample Duplicates

LCSs were prepared in duplicate and analyzed. LCS and LCSD recoveries reported and the relative percent differences (RPDs) between the LCS and/or LCSD recoveries were within the laboratory's acceptance criteria except for compound DX DRO C12-C24 w/ SiGel in batch numbers 181860007A and 181930005A.

In batch 181860007A, sample DUP-4-WD-180628 was reanalyzed due to LCS recovery was below (2%) than the lower control limit in the initial analysis. All compounds associated with the LCS/LCSD analysis exhibited recoveries within the control limits in re-extracted analysis. However, the re-extracted analysis was performed outside of holding time from date of collection. Therefore, the initial analysis in batch number 181860007A is reported and qualified for low LCS recovery as UJ.

Sample MW-513-W-180628 was reanalyzed due to surrogate recovery outside the control limit in initial batch number 181840030A. Re-analysis batch number 181930005A was ignored due to low LCS recovery. Therefore, initial batch number 181840030A was considered for LCS/LCSD recoveries within acceptance criteria.

Samples associated with LCS/LCSD exhibited recoveries outside the control limit presented in the following table:

Field Sample ID	Parameter	LCS Recovery	LCSD Recovery	RPD	RPD Limit	Validation Qualifier
DUP-4-WD-180628	DRO	28	--	--	--	UJ

Notes:

DRO: diesel range organics reported as DX DRO C12-C24

UJ: the analyte was analyzed for, but was not detected and the reported quantitation limit is approximate

### Matrix spike/Matrix spike duplicates

Matrix spikes were prepared in duplicate and analyzed. MS and MSD analysis must exhibit a percent recoveries and relative percent differences within the laboratory's acceptance criteria.

The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where compound concentration detected in the parent sample exceeds the MS/MSD concentration by factor four.

MS/MSD was performed using sample MW-509-W-180628 and results were observed within acceptance criteria besides for one cPAH constituent, benzo(a)pyrene, and sulfate in SDG 1961024. The MS/MSD exhibited low recoveries 24%/18% therefore associated sample results were qualified as UJ. The MS recovery for sulfate was observed 5% recoveries high bias compared to the acceptance criteria therefore associated sample results were qualified as J and the data is considered as valid.

For method NWTPH-Gx, MS/MSD recoveries observed 6%/8% high bias compared to the acceptance criteria but sample result was not detected therefore, associated sample result was not qualified.

Samples associated with MS/MSD exhibited recoveries outside the control limit presented in the following table:

Field Sample ID	Parameter	MS Recovery	MSD Recovery	Validation Qualifier	Laboratory Limit
MW-509-W-180628	Benzo(a)pyrene	41	47	UJ	65-126
MW-509-W-180628	Sulfate	119	NA	J	90-110

Notes:

J: estimated

UJ: the analyte was analyzed for, but was not detected and the reported quantitation limit is approximate

NA: not analyzed

### Field Duplicates

Field duplicate was collected for SDG 1961024 and all precision criteria were met except for methane (47) in samples MW-512-W-180628/DUP-2-WD-180628 and sulfate (22) in samples MW-518-W-180628/DUP-4-WD-180628 exhibited RPDs greater than 20%. The associated sample results were qualified as J.

Duplicate sample ID and Parent field sample ID were updated in the following table:

Duplicate Sample ID	Field Sample ID
MW-512-W-180628	DUP-2-WD-180628
MW-503-W-180628	DUP-3-WD-180628
MW-518-W-180628	DUP-4-WD-180628

### Laboratory Duplicates

Laboratory duplicate analysis was done using sample MW-139R-W-180628 and MW-509-W-180628 for manganese. All precision criteria were met and acceptable for SDG 1961024.

Laboratory duplicate analysis was done using sample MW-509-W-180628 and MW-514-W-180628 for nitrate nitrogen(20%) and sulfate(16%) exhibited RPDs greater than acceptance criteria. The associated sample results were qualified as J.

## CONCLUSION

The objective of this validation memorandum is to demonstrate that sufficient number of representative samples were collected, and the resulting analytical data were acceptable according to the USEPA guidelines and the CMP requirements.

- Precision of the data was verified through the review of field and laboratory data quality indicators that include LCS/LCSD, MS/MSD, FD and LR RPDs. Two FD and LR result exceeded RPD criteria and results were qualified as estimated. The data is considered as valid. Precision was acceptable.
- Accuracy of the data was verified through the review of surrogate, LCS and MS recoveries. One MS result qualified as estimated for high recovery. One sample result was qualified as estimated for MS/MSD exhibited low recoveries. One sample result was qualified as estimated for low LCS recoveries. One sample result was qualified as estimated for low surrogate recoveries. The data is considered as valid. Accuracy was acceptable.
- Representativeness of the data was verified through the sample collection, storage and preservation procedures, verification of holding time compliance and evaluation of blank data. The laboratory did not note any discrepancies with sample collection, storage or preservation procedures. All data were reported from analyses within the recommended holding time. The method blank and trip blank samples were free of contamination with no qualification required.
- Comparability of the data was ensured through the use of standard analytical procedures and standard units for reporting. Results obtained are comparable to industry standards in that the collection and analytical techniques followed approved, documented procedures.
- Completeness is a measure of the number of valid measurements obtained in relation to the total number of measurements planned. Completeness is expressed as the percentage of valid or usable measurements compared to planned measurements. Valid data are defined as all data that are not rejected for project use. All data were considered valid. The completeness goal was met for all analytes.

## REFERENCES

Arcadis. 2017. Final Compliance Monitoring Plan. Former Unocal Edmonds Bulk Fuel Terminal. July 31.

USEPA 2017. National Functional Guidelines for Superfund Organic Methods Data Review (USEPA-540-R-2017-002). January.

## ATTACHMENTS

Table 1: Sample Summary

Table 2: Qualified Results Summary

**Table 1: Sample Summary**

<b>Field Sample ID</b>	<b>Laboratory Sample ID</b>	<b>Sample Date</b>	<b>Sample Time</b>	<b>Sample Purpose</b>
MW-101-W-180628	9684389	06/28/2018	11:35	Regular
MW-139R-W-180628	9684390	06/28/2018	11:25	Regular
MW-503-W-180628	9684391	06/28/2018	09:00	Regular
MW-504-W-180628	9684392	06/28/2018	10:20	Regular
MW-505-W-180628	9684393	06/28/2018	10:50	Regular
MW-506-W-180628	9684394	06/28/2018	09:40	Regular
MW-507-W-180628	9684395	06/28/2018	08:30	Regular
MW-509-W-180628	9684396	06/28/2018	08:35	Regular
MW-512-W-180628	9684400	06/28/2018	08:40	Regular
MW-513-W-180628	9684401	06/28/2018	10:40	Regular
MW-514-W-180628	9684402	06/28/2018	09:50	Regular
MW-515-W-180628	9684403	06/28/2018	10:25	Regular
MW-516-W-180628	9684404	06/28/2018	11:20	Regular
MW-517-W-180628	9684405	06/28/2018	12:35	Regular
MW-518-W-180628	9684406	06/28/2018	12:50	Regular
MW-520-W-180628	9684407	06/28/2018	11:30	Regular
MW-521-W-180628	9684408	06/28/2018	12:30	Regular
MW-522-W-180628	9684409	06/28/2018	14:00	Regular
DUP-2-WD-180628	9684410	06/28/2018	NA	Field Duplicate
DUP-3-WD-180628	9684411	06/28/2018	NA	Field Duplicate
DUP-4-WD-180628	9684412	06/28/2018	NA	Field Duplicate
Trip Blank-T-180628	9684413	06/28/2018	NA	Trip Blank

Note:  
NA: not applicable

**Table 2: Qualified Results Summary**

Laboratory Sample ID	Field Sample ID	Sample Purpose	SDG	Analytical Method	Parameter	Lab. Result	Unit	Lab. Qualifier	Validation Qualifier	Reason Code	Detect Flag
9684396	MW-509-W-180628	REG	1961024	8270C SIM	Benzo(a)pyrene	ND	ug/l	--	UJ	MSL,MSDL	N
9684396	MW-509-W-180628	REG	1961024	EPA 300.0	Sulfate	73,100	ug/l	--	J	MSH,LR	Y
9684401	MW-513-W-180628	REG	1961024	Ecology NWTPH-DX	DRO	ND	ug/l	--	UJ	SURL	N
9684401	MW-513-W-180628	REG	1961024	Ecology NWTPH-DX	HRO	ND	ug/l	--	UJ	SURL	N
9684402	MW-514-W-180628	REG	1961024	EPA 300.0	Nitrate Nitrogen	280	ug/l	--	J	LR	Y
9684400	MW-512-W-180628	REG	1961024	RSK 175	Methane	68	ug/l	--	J	FD	Y
9684410	DUP-2-WD-180628	FD	1961024	RSK 175	Methane	42	ug/l	--	J	FD	Y
9684406	MW-518-W-180628	REG	1961024	EPA 300.0	Sulfate	18,000	ug/l	--	J	FD	Y
9684412	DUP-4-WD-180628	REG	1961024	Ecology NWTPH-DX	DRO	ND	ug/l	--	UJ	LCSL	Y
9684412	DUP-4-WD-180628	FD	1961024	EPA 300.0	Sulfate	23,600	ug/l	--	J	FD	Y

Notes:

Lab. : Laboratory

REG: regular

SDG: sample delivery group

SIM: selective ion monitoring

Ecology: Washington State Department of Ecology

DRO: diesel range organics reported as DX DRO C12-C24

HRO: Heavy oil range organics reported as DX HRO C24-C40

J: the concentration is an approximate value

UJ: the analyte was analyzed for, but was not detected and the reported quantitation limit is approximate

MSL:MS recovery was below the lower control limit

MSH: MS recovery was above the upper control limit

MSDL: MSD recovery was below the lower control limit

SURL: surrogate recovery below than lower acceptance limit

FD: field duplicate exceeded RPD

LR: laboratory replicate exceeded RPD

ug/L: micrograms per liter

ND: non-detect

N: analyte not detected

Y: analyte detected



# Data Validation Memorandum

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<b>TO:</b>	Ophélie Encelle	<b>SDG:</b>	1961256
<b>FROM:</b>	Dilip Kumar	<b>SITE:</b>	Former Unocal Edmonds Bulk Fuel Terminal Edmonds, Washington
<b>DATE:</b>	November 30, 2018		

## INTRODUCTION

This report was prepared by Arcadis Consulting India Pvt Ltd for Arcadis U.S., Inc. (Arcadis) to provide a data validation of the analytical results for the groundwater samples collected at the former Union Oil Company of California Edmonds Bulk Fuel Terminal, located at 11720 Unoco Road, Edmonds, Washington (Site). Groundwater samples are collected and submitted to a Washington State Department of Ecology (Ecology) approved laboratory, Lancaster Laboratories Environmental.

Particularly, this report summarizes the level II data validation findings of the analytical results reported in the sample delivery group (SDG) 1961256 for 4 groundwater samples and 1 trip blank collected on June 29, 2018. Matrix spike/matrix spike duplicate (MS/MSD) was requested for 1 water sample. The samples for analysis and qualified results are listed in Table 1 and Table 2. The data were reviewed in accordance with United States Environmental Protection Agency (USEPA, 2017), National Functional Guidelines for Superfund Organic Methods Data Review.

According to the July 2017 compliance monitoring plan (CMP), groundwater samples are submitted to an Ecology-approved laboratory under a chain-of-custody and analyzed in accordance with following methods:

- Quarterly for:
  - Benzene by USEPA Method 8021B
  - Gasoline range organics (GRO) by Ecology Method NWTPH-Gx
  - Diesel range organics (DRO) and heavy-oil range organics (HO) by Ecology Method NWTPH-Dx (after silica gel cleanup)
  - Carcinogenic polyaromatic hydrocarbons (cPAHs) by USEPA Method 8270 SIM
- Biannually for:
  - Sulfate and nitrate by USEPA Method 300.0
  - Dissolved methane by USEPA Method RSK 175
  - Dissolved manganese by USEPA Method 200.8 (field filtered)
  - Ferrous iron (Hach field kit).

## DATA VALIDATION

The analytical data were reviewed to evaluate the usability of the data. The data validation process includes the following category:

- Data Completeness

- Holding Times and Preservation
- Blanks
- Deuterated Monitoring Compounds (Surrogates)
- Laboratory Control Samples/Laboratory Control Samples Duplicate (LCS/LCSD)
- Matrix Spike/Matrix Spike Duplicates (MS/MSD)
- Field Duplicates (FD)
- Laboratory Duplicates/Replicates (LR)

Groundwater samples were analyzed for benzene (USEPA method 8021B), GRO (Ecology method NWTPH-Gx), DRO/HO (Ecology method NWTPH-Dx after silica gel cleanup), cPAHs (USEPA method 8270C SIM), Manganese (USEPA 200.8), Methane (RSK 175), Sulfate and Nitrate Nitrogen (USEPA 300.0).

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer.

The data review process performed involved evaluating the following parameters: sample receipt, case narrative, holding times, method blank results, trip blank results, LCS/LCSD results, MS/MSD results, field and laboratory duplicate results and surrogate recoveries.

Each category is further described in the following sections.

## Data Completeness

Groundwater sample analyses were performed as requested on chain-of-custody documentation. The laboratory reported all requested water sample analyses and the deliverable data reports were complete.

## Holding Times and Preservation

All analyses were performed within the method-specified holding time except for Nitrate Nitrogen. Nitrate Nitrogen in below listed samples were exceeded holding times of 48 hours and associated sample results were qualified as estimated "J".

In addition, all samples were collected and preserved appropriately.

Holding time exceedance presented in the following table:

Field Sample ID	Analyte	Method	Holding Time	Date Sampled	Date of Analysis	Exceedance
MW-8R-W-180629	Nitrate Nitrogen	EPA 300	48 hours	06/29/2018	07/01/2018	55 hours
MW-20R-W-180629	Nitrate Nitrogen	EPA 300	48 hours	06/29/2018	07/01/2018	56 hours
MW-126-W-180629	Nitrate Nitrogen	EPA 300	48 hours	06/29/2018	07/01/2018	54 hours
MW-143-W-180629	Nitrate Nitrogen	EPA 300	48 hours	06/29/2018	07/01/2018	57 hours

## Blanks

Quality assurance (QA) blanks (i.e., method and field blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Laboratory method blanks measure laboratory contamination. Rinsate blanks measure contamination of samples during field operations by non-dedicated sampling equipment. Trip blanks measure contamination of samples during samples transportation.

### Laboratory Method Blanks

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank (common laboratory contaminant compounds are calculated at ten times) is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

A method blank was analyzed for each method. No method blank contamination was detected.

Field sample ID qualified for blank contamination summarized in the following table:

Field Sample ID	Blank type	Method	Parameter	Unit	Blank Result	Sample Result	Validation Qualifier
NE	NE	NE	NE	NE	NE	NE	NE

### Rinsate Blank

No rinsate blank is required since the equipment is dedicated to the sampling.

### Trip blank

No detections were observed in the trip blank therefore no sample contamination is suspected during sample transportation and results are meeting QA requirements.

### Deuterated Monitoring Compounds (Surrogates)

Appropriate numbers of surrogate compounds were spiked into each sample for the USEPA method 8021B, USEPA method 8270C SIM, Ecology NWTPH-Gx and Ecology NWTPH-Dx. All surrogate compound recoveries were within the laboratory's acceptance criteria.

Field Sample IDs associated with surrogates exhibiting outside of control limits presented in the following table:

Field Sample ID	Surrogates	Recovery	Laboratory Limit
NE	NE	NE	NE

### Laboratory Control Sample/ Laboratory Control Sample Duplicates

LCSs were prepared in duplicate and analyzed. LCS and LCSD recoveries reported and the relative percent differences (RPDs) between the LCS and LCSD recoveries were within the laboratory's acceptance criteria

Samples associated with LCS/LCSD exhibited recoveries outside the control limit presented in the following table:

Field Sample ID	Parameter	LCS Recovery	LCSD Recovery	RPD	RPD Limit	Validation Qualifier
NE	NE	NE	NE	NE	NE	NE

### Matrix spike/Matrix spike duplicates

Matrix spikes were prepared in duplicate and analyzed. MS and MSD analysis must exhibit a percent recoveries and relative percent differences within the laboratory's acceptance criteria.

The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where compound concentration detected in the parent sample exceeds the MS/MSD concentration by factor four.

MS/MSD was performed using sample MW-143-W-180629 and results were observed within acceptance criteria besides for GRO, DRO, and Manganese in SDG 1961256. The MS/MSD recoveries for GRO were observed 14%/15% high recoveries bias and 7%/7% low recoveries bias for DRO compared to the

acceptance criteria. The associated sample results were not detected, therefore associated sample result was not qualified.

## Field Duplicates

Field duplicate was not collected for SDG 1961256.

## Laboratory Duplicates

Laboratory duplicate analysis was done using sample MW-143-W-180629 for nitrate nitrogen, sulfate and manganese. All precision criteria were met and acceptable for SDG 1961256.

Laboratory duplicate analysis was done using sample MW-8R-W-180629 for manganese and all precision criteria were met and acceptable for SDG 1961256.

## CONCLUSION

The objective of this validation memorandum is to demonstrate that sufficient number of representative samples were collected, and the resulting analytical data were acceptable according to the USEPA guidelines and the CMP requirements.

- Precision of the data was verified through the review of field and laboratory data quality indicators that include LCS/LCSD, MS/MSD and LR RPDs. Precision was acceptable.
- Accuracy of the data was verified through the review of surrogate, LCS and MS recoveries. Accuracy was acceptable.
- Representativeness of the data was verified through the sample collection, storage and preservation procedures, verification of holding time compliance and evaluation of blank data. The laboratory did not note any discrepancies with sample collection, storage or preservation procedures. All data were reported from analyses within the recommended holding time except four samples for Nitrate, Nitrogen were exceeded the holding time and qualified as estimated. The method blank and trip blank samples were free of contamination with no qualification required.
- Comparability of the data was ensured through the use of standard analytical procedures and standard units for reporting. Results obtained are comparable to industry standards in that the collection and analytical techniques followed approved, documented procedures.
- Completeness is a measure of the number of valid measurements obtained in relation to the total number of measurements planned. Completeness is expressed as the percentage of valid or usable measurements compared to planned measurements. Valid data are defined as all data that are not rejected for project use. All data were considered valid. The completeness goal was met for all analytes.

## REFERENCES

Arcadis. 2017. Final Compliance Monitoring Plan. Former Unocal Edmonds Bulk Fuel Terminal. July 31.

USEPA 2017. National Functional Guidelines for Superfund Organic Methods Data Review (USEPA-540-R-2017-002). January.

## ATTACHMENTS

Table 1: Sample Summary

Table 2: Qualified Results Summary

**Table 1: Sample Summary**

<b>Field Sample ID</b>	<b>Laboratory Sample ID</b>	<b>Sample Date</b>	<b>Sample Time</b>	<b>Sample Purpose</b>
MW-8R-W-180629	9685396	06/29/2018	09:45	Regular
MW-20R-W-180629	9685397	06/29/2018	09:20	Regular
MW-126-W-180629	9685398	06/29/2018	08:30	Regular
MW-143-W-180629	9685399	06/29/2018	08:00	Regular
MW-143-W-180629	9685400	06/29/2018	08:00	Matrix Spike
MW-143-W-180629	9685401	06/29/2018	08:00	Matrix Spike Duplicate
Trip Blank-T-180629	9685403	06/29/2018	NA	Trip Blank

Note:

NA: not applicable

**Table 2: Qualified Results Summary**

Laboratory Sample ID	Field Sample ID	Sample Purpose	SDG	Analytical Method	Parameter	Laboratory Result	Unit	Laboratory Qualifier	Validation Qualifier	Reason Code	Detect Flag
9685396	MW-8R-W-180629	REG	1961256	EPA 300.0	Nitrate Nitrogen	ND	ug/l	--	UJ	HTA	N
9685397	MW-20R-W-180629	REG	1961256	EPA 300.0	Nitrate Nitrogen	ND	ug/l	--	UJ	HTA	N
9685398	MW-126-W-180629	REG	1961256	EPA 300.0	Nitrate Nitrogen	ND	ug/l	--	UJ	HTA	N
9685399	MW-143-W-180629	REG	1961256	EPA 300.0	Nitrate Nitrogen	ND	ug/l	--	UJ	HTA	N

Notes:

REG: regular

SDG: sample delivery group

ND: non-detect

ug/L: micrograms per liter

UJ: the analyte was analyzed for, but was not detected and the reported quantitation limit is approximate

N: analyte not detected

HTA: analytical holding time exceeded

# Data Validation Memorandum

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<b>TO:</b>	Ophélie Encelle	<b>SDG:</b>	1988392
<b>FROM:</b>	Dilip Kumar	<b>SITE:</b>	Former Unocal Edmonds Bulk Fuel Terminal Edmonds, Washington
<b>DATE:</b>	December 07, 2018		

## INTRODUCTION

This report was prepared by Arcadis Consulting India Pvt Ltd for Arcadis U.S., Inc. (Arcadis) to provide a data validation of the analytical results for the groundwater samples collected at the former Union Oil Company of California Edmonds Bulk Fuel Terminal, located at 11720 Unoco Road, Edmonds, Washington (Site). Groundwater samples are collected and submitted to a Washington State Department of Ecology (Ecology) approved laboratory, Lancaster Laboratories Environmental.

Particularly, this report summarizes the level II data validation findings of the analytical results reported in the sample delivery group (SDG) 1988392 for 10 groundwater samples, 1 field duplicate and 1 trip blank collected on September 17, 2018. The samples for analysis and qualified results are listed in Table 1 and Table 2. The data were reviewed in accordance with United States Environmental Protection Agency (USEPA, 2017), National Functional Guidelines for Superfund Organic Methods Data Review.

According to the July 2017 compliance monitoring plan (CMP), groundwater samples are submitted to an Ecology-approved laboratory under a chain-of-custody and analyzed in accordance with following methods:

- Quarterly for:
  - Benzene by USEPA Method 8021B
  - Gasoline range organics (GRO) by Ecology Method NWTPH-Gx
  - Diesel range organics (DRO) and heavy-oil range organics (HO) by Ecology Method NWTPH-Dx (after silica gel cleanup)
  - Carcinogenic polyaromatic hydrocarbons (cPAHs) by USEPA Method 8270 SIM
- Biannually for:
  - Sulfate and nitrate by USEPA Method 300.0
  - Dissolved methane by USEPA Method RSK 175
  - Dissolved manganese by USEPA Method 200.8 (field filtered)
  - Ferrous iron (Hach field kit).

## DATA VALIDATION

The analytical data were reviewed to evaluate the usability of the data. The data validation process includes the following category:

- Data Completeness
- Holding Times and Preservation

- Blanks
- Deuterated Monitoring Compounds (Surrogates)
- Laboratory Control Samples/Laboratory Control Samples Duplicate (LCS/LCSD)
- Matrix Spike/Matrix Spike Duplicates (MS/MSD)
- Field Duplicates (FD)
- Laboratory Duplicates/Replicates (LR)

Groundwater samples were analyzed for benzene (USEPA method 8021B), GRO (Ecology method NWTPH-Gx), DRO/HO (Ecology method NWTPH-Dx after silica gel cleanup) and cPAHs (USEPA method 8270C SIM).

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer.

The data review process performed involved evaluating the following parameters: sample receipt, case narrative, holding times, method blank results, trip blank results, LCS/LCSD results, MS/MSD results, field and laboratory duplicate results and surrogate recoveries.

Each category is further described in the following sections.

### Data Completeness

Groundwater sample analyses were performed as requested on chain-of-custody documentation. The laboratory reported all requested water sample analyses and the deliverable data reports were complete.

### Holding Times and Preservation

All analyses were performed within the method-specified holding time. In addition, all samples were collected and preserved appropriately.

Holding time exceedance presented in the following table:

Field Sample ID	Analyte	Method	Holding Time	Date Sampled	Date of Analysis	Exceedance
NE	NE	NE	NE	NE	NE	NE

Notes:

NE: not encountered

### Blanks

Quality assurance (QA) blanks (i.e., method and field blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Laboratory method blanks measure laboratory contamination. Rinsate blanks measure contamination of samples during field operations by non-dedicated sampling equipment. Trip blanks measure contamination of samples during samples transportation.

#### Laboratory Method Blanks

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank (common laboratory contaminant compounds are calculated at ten times) is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

A method blank was analyzed for each method. No method blank contamination was detected.



Field sample ID qualified for blank contamination summarized in the following table:

Field Sample ID	Blank type	Method	Parameter	Unit	Blank Result	Sample Result	Validation Qualifier
NE	NE	NE	NE	NE	NE	NE	NE

#### *Rinsate Blank*

No rinsate blank is required since the equipment is dedicated to the sampling.

#### *Trip blank*

No detections were observed in the trip blank therefore no sample contamination is suspected during sample transportation and results are meeting QA requirements.

### Deuterated Monitoring Compounds (Surrogates)

Appropriate numbers of surrogate compounds were spiked into each sample for the USEPA method 8021B, USEPA method 8270C SIM, Ecology NWTPH-Gx and Ecology NWTPH-Dx. All surrogate compound recoveries were within the laboratory's acceptance criteria.

Field Sample IDs associated with surrogates exhibiting outside of control limits presented in the following table:

Field Sample ID	Surrogates	Recovery	Laboratory Limit
NE	NE	NE	NE

### Laboratory Control Sample/ Laboratory Control Sample Duplicates

LCSs were prepared in duplicate and analyzed. LCS and LCSD recoveries reported and the relative percent differences (RPDs) between the LCS and LCSD recoveries were within the laboratory's acceptance criteria besides for three cPAHs: Benzo(a)anthracene, Benzo(k)fluoranthene and Chrysene . The LCS recovery for cPAHs were observed in the range of 1% to 9% high bias compared to the acceptance criteria. The associated sample results were non-detect, therefore associated sample results were not qualified.

Samples associated with LCS/LCSD exhibited recoveries outside the control limit presented in the following table:

Field Sample ID	Parameter	LCS Recovery	LCSD Recovery	RPD	RPD Limit	Validation Qualifier
NE	NE	NE	NE	NE	NE	NE

### Matrix spike/Matrix spike duplicates

MS/MSD were not collected for SDG 1988392.

### Field Duplicates

Field duplicate was collected for SDG 1988392 and all precision criteria were met.

Duplicate sample ID and Parent field sample ID were updated in the following table:

Duplicate Sample ID	Field Sample ID
DUP-1-WD-180917	MW-533-W-180917

### Laboratory Duplicates

Laboratory duplicate was not performed for SDG 1988392.

## CONCLUSION

The objective of this validation memorandum is to demonstrate that sufficient number of representative samples were collected, and the resulting analytical data were acceptable according to the USEPA guidelines and the CMP requirements.

- Precision of the data was verified through the review of field and laboratory data quality indicators that include LCS/LCSD RPDs. Precision was acceptable.
- Accuracy of the data was verified through the review of surrogate and LCS recoveries. Accuracy was acceptable.
- Representativeness of the data was verified through the sample collection, storage and preservation procedures, verification of holding time compliance and evaluation of blank data. The laboratory did not note any discrepancies with sample collection, storage or preservation procedures. All data were reported from analyses within the recommended holding time. The method blank and trip blank samples were free of contamination with no qualification required.
- Comparability of the data was ensured through the use of standard analytical procedures and standard units for reporting. Results obtained are comparable to industry standards in that the collection and analytical techniques followed approved, documented procedures.
- Completeness is a measure of the number of valid measurements obtained in relation to the total number of measurements planned. Completeness is expressed as the percentage of valid or usable measurements compared to planned measurements. Valid data are defined as all data that are not rejected for project use. All data were considered valid. The completeness goal was met for all analytes.

## REFERENCES

- Arcadis. 2017. Final Compliance Monitoring Plan. Former Unocal Edmonds Bulk Fuel Terminal. July 31.
- USEPA 2017. National Functional Guidelines for Superfund Organic Methods Data Review (USEPA-540-R-2017-002). January.

## ATTACHMENTS

- Table 1: Sample Summary  
Table 2: Qualified Results Summary

**Table 1: Sample Summary**

<b>Field Sample ID</b>	<b>Laboratory Sample ID</b>	<b>Sample Date</b>	<b>Sample Time</b>	<b>Sample Purpose</b>
MW-E-R-W-180917	9807865	09/17/2018	12:35	Regular
MW-104-W-180917	9807866	09/17/2018	09:45	Regular
MW-129R-W-180917	9807867	09/17/2018	13:10	Regular
MW-525-W-180917	9807868	09/17/2018	09:00	Regular
MW-526-W-180917	9807869	09/17/2018	10:50	Regular
MW-531-W-180917	9807870	09/17/2018	08:55	Regular
MW-532-W-180917	9807871	09/17/2018	10:15	Regular
MW-533-W-180917	9807872	09/17/2018	11:40	Regular
MW-534-W-180917	9807873	09/17/2018	11:50	Regular
MW-535-W-180917	9807874	09/17/2018	10:55	Regular
DUP-1-WD-180917	9807875	09/17/2018	NA	Field Duplicate
QA-T-180917	9807876	09/17/2018	NA	Trip Blank

Note:

NA: not applicable



**Table 2: Qualified Results Summary**

Laboratory Sample ID	Field Sample ID	Sample Purpose	SDG	Analytical Method	Parameter	Laboratory Result	Unit	Laboratory Qualifier	Validation Qualifier	Reason Code	Detect Flag
NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE

Notes:

NE: not encountered

SDG: sample delivery group

# Data Validation Memorandum

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<b>TO:</b>	Ophélie Encelle	<b>SDG:</b>	1989359
<b>FROM:</b>	Dilip Kumar	<b>SITE:</b>	Former Unocal Edmonds Bulk Fuel Terminal Edmonds, Washington
<b>DATE:</b>	December 07, 2018		

## INTRODUCTION

This report was prepared by Arcadis Consulting India Pvt Ltd for Arcadis U.S., Inc. (Arcadis) to provide a data validation of the analytical results for the groundwater samples collected at the former Union Oil Company of California Edmonds Bulk Fuel Terminal, located at 11720 Unoco Road, Edmonds, Washington (Site). Groundwater samples are collected and submitted to a Washington State Department of Ecology (Ecology) approved laboratory, Lancaster Laboratories Environmental.

Particularly, this report summarizes the level II data validation findings of the analytical results reported in the sample delivery group (SDG) 1989359 for 9 groundwater samples, 1 field duplicate and 1 trip blank collected on September 18, 2018. Matrix spike/matrix spike duplicate (MS/MSD) was requested for 1 water sample. The samples for analysis and qualified results are listed in Table 1 and Table 2. The data were reviewed in accordance with United States Environmental Protection Agency (USEPA. 2017), National Functional Guidelines for Superfund Organic Methods Data Review.

According to the July 2017 compliance monitoring plan (CMP), groundwater samples are submitted to an Ecology-approved laboratory under a chain-of-custody and analyzed in accordance with following methods:

- Quarterly for:
  - Benzene by USEPA Method 8021B
  - Gasoline range organics (GRO) by Ecology Method NWTPH-Gx
  - Diesel range organics (DRO) and heavy-oil range organics (HO) by Ecology Method NWTPH-Dx (after silica gel cleanup)
  - Carcinogenic polyaromatic hydrocarbons (cPAHs) by USEPA Method 8270 SIM
- Biannually for:
  - Sulfate and nitrate by USEPA Method 300.0
  - Dissolved methane by USEPA Method RSK 175
  - Dissolved manganese by USEPA Method 200.8 (field filtered)
  - Ferrous iron (Hach field kit).

## DATA VALIDATION

The analytical data were reviewed to evaluate the usability of the data. The data validation process includes the following category:

- Data Completeness

- Holding Times and Preservation
- Blanks
- Deuterated Monitoring Compounds (Surrogates)
- Laboratory Control Samples/Laboratory Control Samples Duplicate (LCS/LCSD)
- Matrix Spike/Matrix Spike Duplicates (MS/MSD)
- Field Duplicates (FD)
- Laboratory Duplicates/Replicates (LR)

Groundwater samples were analyzed for benzene (USEPA method 8021B), GRO (Ecology method NWTPH-Gx), DRO/HO (Ecology method NWTPH-Dx after silica gel cleanup) and cPAHs (USEPA method 8270C SIM).

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer.

The data review process performed involved evaluating the following parameters: sample receipt, case narrative, holding times, method blank results, trip blank results, LCS/LCSD results, MS/MSD results, field and laboratory duplicate results and surrogate recoveries.

Each category is further described in the following sections.

### Data Completeness

Groundwater sample analyses were performed as requested on chain-of-custody documentation. The laboratory reported all requested water sample analyses and the deliverable data reports were complete.

### Holding Times and Preservation

All analyses were performed within the method-specified holding time. In addition, all samples were collected and preserved appropriately.

Holding time exceedance presented in the following table:

Field Sample ID	Analyte	Method	Holding Time	Date Sampled	Date of Analysis	Exceedance
NE	NE	NE	NE	NE	NE	NE

Notes:

NE: not encountered

### Blanks

Quality assurance (QA) blanks (i.e., method and field blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Laboratory method blanks measure laboratory contamination. Rinsate blanks measure contamination of samples during field operations by non-dedicated sampling equipment. Trip blanks measure contamination of samples during samples transportation.

#### Laboratory Method Blanks

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank (common laboratory contaminant compounds are calculated at ten times) is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

A method blank was analyzed for each method. No method blank contamination was detected.

Field sample ID qualified for blank contamination summarized in the following table:

Field Sample ID	Blank type	Method	Parameter	Unit	Blank Result	Sample Result	Validation Qualifier
NE	NE	NE	NE	NE	NE	NE	NE

#### *Rinsate Blank*

No rinsate blank is required since the equipment is dedicated to the sampling.

#### *Trip blank*

No detections were observed in the trip blank therefore no sample contamination is suspected during sample transportation and results are meeting QA requirements.

### Deuterated Monitoring Compounds (Surrogates)

Appropriate numbers of surrogate compounds were spiked into each sample for the USEPA method 8021B, USEPA method 8270C SIM, Ecology NWTPH-Gx and Ecology NWTPH-Dx. All surrogate compound recoveries were within the laboratory's acceptance criteria.

Field Sample IDs associated with surrogates exhibiting outside of control limits presented in the following table:

Field Sample ID	Surrogates	Recovery	Laboratory Limit
NE	NE	NE	NE

### Laboratory Control Sample/ Laboratory Control Sample Duplicates

LCSs were prepared in duplicate and analyzed. LCS and LCSD recoveries reported and the relative percent differences (RPDs) between the LCS and LCSD recoveries were within the laboratory's acceptance criteria besides for four cPAHs, Benzo(a)anthracene, Benzo(k)fluoranthene, Chrysene and Dibenz(a,h)anthracene. The LCS recovery for cPAHs were observed in the range of 2% to 8% high bias compared to the acceptance criteria. The associated sample results were non-detect, therefore associated sample results were not qualified.

In addition, LCS/LCSD RPD for DRO C12-C24 in batch 1826900009A was exceeded laboratory's acceptance criteria. The associated sample result was non-detect, therefore associated sample results were not qualified.

Samples associated with LCS/LCSD exhibited recoveries outside the control limit presented in the following table:

Field Sample ID	Parameter	LCS Recovery	LCSD Recovery	RPD	RPD Limit	Validation Qualifier
NE	NE	NE	NE	NE	NE	NE

### Matrix spike/Matrix spike duplicates

Matrix spikes were prepared in duplicate and analyzed. MS and MSD analysis must exhibit a percent recoveries and relative percent differences within the laboratory's acceptance criteria.

The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where compound concentration detected in the parent sample exceeds the MS/MSD concentration by factor four.

MS/MSD was performed using sample MW-126-W-180918 and results were observed within acceptance criteria besides for Benzo(a)anthracene and NWTPH-Gx water C7-C12 in SDG 1989359. The MS/MSD

recoveries for Benzo(a)anthracene were observed 7%/10% and NWTPH-Gx were observed 3%/5% high bias compared to the acceptance criteria. The associated sample results were non-detect, therefore associated sample results were not qualified.

Samples associated with MS/MSD exhibited recoveries outside the control limit presented in the following table:

Field Sample ID	Parameter	MS Recovery	Validation Qualifier	Laboratory Limit
NE	NE	NE	NE	NE

### Field Duplicates

Field duplicate was collected for SDG 1989359 and all precision criteria were met.

Duplicate sample ID and Parent field sample ID were updated in the following table:

Duplicate Sample ID	Field Sample ID
DUP-2-WD-180918	MW-101-W-180918

### Laboratory Duplicates

Laboratory duplicate was not performed for SDG 1989359.

## CONCLUSION

The objective of this validation memorandum is to demonstrate that sufficient number of representative samples were collected, and the resulting analytical data were acceptable according to the USEPA guidelines and the CMP requirements.

- Precision of the data was verified through the review of field and laboratory data quality indicators that include LCS/LCSD and MS/MSD RPDs. Precision was acceptable.
- Accuracy of the data was verified through the review of surrogate, LCS and MS recoveries. Accuracy was acceptable.
- Representativeness of the data was verified through the sample collection, storage and preservation procedures, verification of holding time compliance and evaluation of blank data. The laboratory did not note any discrepancies with sample collection, storage or preservation procedures. All data were reported from analyses within the recommended holding time. The method blank and trip blank samples were free of contamination with no qualification required.
- Comparability of the data was ensured through the use of standard analytical procedures and standard units for reporting. Results obtained are comparable to industry standards in that the collection and analytical techniques followed approved, documented procedures.
- Completeness is a measure of the number of valid measurements obtained in relation to the total number of measurements planned. Completeness is expressed as the percentage of valid or usable measurements compared to planned measurements. Valid data are defined as all data that are not rejected for project use. All data were considered valid. The completeness goal was met for all analytes.

## REFERENCES

Arcadis. 2017. Final Compliance Monitoring Plan. Former Unocal Edmonds Bulk Fuel Terminal. July 31.



## **ATTACHMENTS**

Table 1: Sample Summary

Table 2: Qualified Results Summary

**Table 1: Sample Summary**

<b>Field Sample ID</b>	<b>Laboratory Sample ID</b>	<b>Sample Date</b>	<b>Sample Time</b>	<b>Sample Purpose</b>
MW-8R-W-180918	9812221	09/18/2018	09:40	Regular
MW-20R-W-180918	9812222	09/18/2018	12:20	Regular
MW-101-W-180918	9812223	09/18/2018	13:10	Regular
MW-126-W-180918	9812224	09/18/2018	08:15	Regular
MW-143-W-180918	9812227	09/18/2018	08:50	Regular
MW-519-W-180918	9812228	09/18/2018	12:00	Regular
MW-520-W-180918	9812229	09/18/2018	09:55	Regular
MW-521-W-180918	9812230	09/18/2018	10:50	Regular
MW-522-W-180918	9812231	09/18/2018	10:55	Regular
DUP-2-WD-180918	9812232	09/18/2018	NA	Field Duplicate
QA-T-180918	9812233	09/18/2018	NA	Trip Blank

Note:

NA: not applicable



**Table 2: Qualified Results Summary**

Laboratory Sample ID	Field Sample ID	Sample Purpose	SDG	Analytical Method	Parameter	Laboratory Result	Unit	Laboratory Qualifier	Validation Qualifier	Reason Code	Detect Flag
NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE

Notes:  
NE: not encountered  
SDG: sample delivery group

# Data Validation Memorandum

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<b>TO:</b>	Ophélie Encelle	<b>SDG:</b>	1989869
<b>FROM:</b>	Dilip Kumar	<b>SITE:</b>	Former Unocal Edmonds Bulk Fuel Terminal Edmonds, Washington
<b>DATE:</b>	December 07, 2018		

## INTRODUCTION

This report was prepared by Arcadis Consulting India Pvt Ltd for Arcadis U.S., Inc. (Arcadis) to provide a data validation of the analytical results for the groundwater samples collected at the former Union Oil Company of California Edmonds Bulk Fuel Terminal, located at 11720 Unoco Road, Edmonds, Washington (Site). Groundwater samples are collected and submitted to a Washington State Department of Ecology (Ecology) approved laboratory, Lancaster Laboratories Environmental.

Particularly, this report summarizes the level II data validation findings of the analytical results reported in the sample delivery group (SDG) 1989869 for 8 groundwater samples, 1 field duplicate and 1 trip blank collected on September 19, 2018. The samples for analysis and qualified results are listed in Table 1 and Table 2. The data were reviewed in accordance with United States Environmental Protection Agency (USEPA. 2017), National Functional Guidelines for Superfund Organic Methods Data Review.

According to the July 2017 compliance monitoring plan (CMP), groundwater samples are submitted to an Ecology-approved laboratory under a chain-of-custody and analyzed in accordance with following methods:

- Quarterly for:
  - Benzene by USEPA Method 8021B
  - Gasoline range organics (GRO) by Ecology Method NWTPH-Gx
  - Diesel range organics (DRO) and heavy-oil range organics (HO) by Ecology Method NWTPH-Dx (after silica gel cleanup)
  - Carcinogenic polyaromatic hydrocarbons (cPAHs) by USEPA Method 8270 SIM
- Biannually for:
  - Sulfate and nitrate by USEPA Method 300.0
  - Dissolved methane by USEPA Method RSK 175
  - Dissolved manganese by USEPA Method 200.8 (field filtered)
  - Ferrous iron (Hach field kit).

## DATA VALIDATION

The analytical data were reviewed to evaluate the usability of the data. The data validation process includes the following category:

- Data Completeness
- Holding Times and Preservation

- Blanks
- Deuterated Monitoring Compounds (Surrogates)
- Laboratory Control Samples/Laboratory Control Samples Duplicate (LCS/LCSD)
- Matrix Spike/Matrix Spike Duplicates (MS/MSD)
- Field Duplicates (FD)
- Laboratory Duplicates/Replicates (LR)

Groundwater samples were analyzed for benzene (USEPA method 8021B), GRO (Ecology method NWTPH-Gx), DRO/HO (Ecology method NWTPH-Dx after silica gel cleanup) and cPAHs (USEPA method 8270C SIM).

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer.

The data review process performed involved evaluating the following parameters: sample receipt, case narrative, holding times, method blank results, trip blank results, LCS/LCSD results, field and laboratory duplicate results and surrogate recoveries.

Each category is further described in the following sections.

### Data Completeness

Groundwater sample analyses were performed as requested on chain-of-custody documentation. The laboratory reported all requested water sample analyses and the deliverable data reports were complete.

### Holding Times and Preservation

All analyses were performed within the method-specified holding time. In addition, all samples were collected and preserved appropriately.

Holding time exceedance presented in the following table:

Field Sample ID	Analyte	Method	Holding Time	Date Sampled	Date of Analysis	Exceedance
NE	NE	NE	NE	NE	NE	NE

Notes:

NE: not encountered

### Blanks

Quality assurance (QA) blanks (i.e., method and field blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Laboratory method blanks measure laboratory contamination. Rinsate blanks measure contamination of samples during field operations by non-dedicated sampling equipment. Trip blanks measure contamination of samples during samples transportation.

#### Laboratory Method Blanks

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank (common laboratory contaminant compounds are calculated at ten times) is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

A method blank was analyzed for each method. No method blank contamination was detected.

Field sample ID qualified for blank contamination summarized in the following table:

Field Sample ID	Blank type	Method	Parameter	Unit	Blank Result	Sample Result	Validation Qualifier
NE	NE	NE	NE	NE	NE	NE	NE

#### *Rinsate Blank*

No rinsate blank is required since the equipment is dedicated to the sampling.

#### *Trip blank*

No detections were observed in the trip blank therefore no sample contamination is suspected during sample transportation and results are meeting QA requirements.

### Deuterated Monitoring Compounds (Surrogates)

Appropriate numbers of surrogate compounds were spiked into each sample for the USEPA method 8021B, USEPA method 8270C SIM, Ecology NWTPH-Gx and Ecology NWTPH-Dx. All surrogate compound recoveries were within the laboratory's acceptance criteria.

Field Sample IDs associated with surrogates exhibiting outside of control limits presented in the following table:

Field Sample ID	Surrogates	Recovery	Laboratory Limit
NE	NE	NE	NE

### Laboratory Control Sample/ Laboratory Control Sample Duplicates

LCSs were prepared in duplicate and analyzed. LCS and LCSD recoveries reported and the relative percent differences (RPDs) between the LCS and LCSD recoveries were within the laboratory's acceptance criteria besides for one cPAH, Benzo(a)anthracene. The LCS recovery for cPAH was observed 3% high bias compared to the acceptance criteria. The associated sample results were non-detect, therefore associated sample results were not qualified.

In addition, LCS/LCSD RPD for DRO C12-C24 in batch 182690009A was exceeded laboratory's acceptance criteria. Therefore, associated detected sample results were qualified as J.

Samples associated with LCS/LCSD exhibited recoveries outside the control limit presented in the following table:

Field Sample ID	Parameter	LCS Recovery	LCSD Recovery	RPD	RPD Limit	Validation Qualifier
MW-509-W-180919	DX DRO C12-C24	29	38	27	20	J
MW-515-W-180919						

Notes

J: the concentration is an approximate value

### Matrix spike/Matrix spike duplicates

MS/MSD were not collected for SDG 1989869.

### Field Duplicates

Field duplicate was collected for SDG 1989869 and all precision criteria were met.

Duplicate sample ID and Parent field sample ID were updated in the following table:

Duplicate Sample ID	Field Sample ID
DUP-3-WD-180919	MW-507-W-180919

### Laboratory Duplicates

Laboratory duplicate was not performed for SDG 1989869.

## CONCLUSION

The objective of this validation memorandum is to demonstrate that sufficient number of representative samples were collected, and the resulting analytical data were acceptable according to the USEPA guidelines and the NPDES and SAP requirements.

- Precision of the data was verified through the review of field and laboratory data quality indicators that include LCS/LCSD RPDs. Two sample results qualified for RPD exceedances. Precision was acceptable.
- Accuracy of the data was verified through the review of surrogate and LCS recoveries. Accuracy was acceptable.
- Representativeness of the data was verified through the sample collection, storage and preservation procedures, verification of holding time compliance and evaluation of blank data. The laboratory did not note any discrepancies with sample collection, storage or preservation procedures. All data were reported from analyses within the recommended holding time. The method blank and trip blank samples were free of contamination with no qualification required.
- Comparability of the data was ensured through the use of standard analytical procedures and standard units for reporting. Results obtained are comparable to industry standards in that the collection and analytical techniques followed approved, documented procedures.
- Completeness is a measure of the number of valid measurements obtained in relation to the total number of measurements planned. Completeness is expressed as the percentage of valid or usable measurements compared to planned measurements. Valid data are defined as all data that are not rejected for project use. All data were considered valid. The completeness goal was met for all analytes.

## REFERENCES

Arcadis. 2017. Final Compliance Monitoring Plan. Former Unocal Edmonds Bulk Fuel Terminal. July 31.

USEPA 2017. National Functional Guidelines for Superfund Organic Methods Data Review (USEPA-540-R-2017-002). January.

## ATTACHMENTS

Table 1: Sample Summary

Table 2: Qualified Results Summary

**Table 1: Sample Summary**

<b>Field Sample ID</b>	<b>Laboratory Sample ID</b>	<b>Sample Date</b>	<b>Sample Time</b>	<b>Sample Purpose</b>
MW-139R-W-180919	9814639	09/19/2018	10:50	Regular
MW-506-W-180919	9814640	09/19/2018	12:15	Regular
MW-507-W-180919	9814641	09/19/2018	12:30	Regular
MW-509-W-180919	9814642	09/19/2018	10:45	Regular
MW-515-W-180919	9814643	09/19/2018	09:45	Regular
MW-516-W-180919	9814644	09/19/2018	08:35	Regular
MW-517-W-180919	9814645	09/19/2018	08:30	Regular
MW-518-W-180919	9814646	09/19/2018	09:25	Regular
DUP-3-WD-180919	9814647	09/19/2018	NA	Field Duplicate
QA-T-180919	9814648	09/19/2018	NA	Trip Blank

Note:  
NA: not applicable



**Table 2: Qualified Results Summary**

Laboratory Sample ID	Field Sample ID	Sample Purpose	SDG	Analytical Method	Parameter	Laboratory Result	Unit	Laboratory Qualifier	Validation Qualifier	Reason Code	Detect Flag
9814642	MW-509-W-180919	REG	1989849	Ecology NWTPH-Dx	DX DRO C12-C24	82	ug/L	--	J	RPD	Y
9814643	MW-515-W-180919	REG	1989849	Ecology NWTPH-Dx	DX DRO C12-C24	120	ug/L	--	J	RPD	Y

Notes:

REG: regular

SDG: sample delivery group

DRO: diesel range organics reported as DX DRO C12-C24

J: the concentration is an approximate value

RPD: relative percent difference exceeded

ug/L: micrograms per liter

Y: analyte detected

# Data Validation Memorandum

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<b>TO:</b>	Ophélie Encelle	<b>SDG:</b>	1990016
<b>FROM:</b>	Dilip Kumar	<b>SITE:</b>	Former Unocal Edmonds Bulk Fuel Terminal Edmonds, Washington
<b>DATE:</b>	December 10, 2018		

## INTRODUCTION

This report was prepared by Arcadis Consulting India Pvt Ltd for Arcadis U.S., Inc. (Arcadis) to provide a data validation of the analytical results for the groundwater samples collected at the former Union Oil Company of California Edmonds Bulk Fuel Terminal, located at 11720 Unoco Road, Edmonds, Washington (Site). Groundwater samples are collected and submitted to a Washington State Department of Ecology (Ecology) approved laboratory, Lancaster Laboratories Environmental.

Particularly, this report summarizes the level II data validation findings of the analytical results reported in the sample delivery group (SDG) 1990016 for 10 groundwater samples, 1 field duplicate and 1 trip blank collected on September 20, 2018. Matrix spike/matrix spike duplicate (MS/MSD) was requested for 1 water sample. The samples for analysis and qualified results are listed in Table 1 and Table 2. The data were reviewed in accordance with United States Environmental Protection Agency (USEPA, 2017), National Functional Guidelines for Superfund Organic Methods Data Review.

According to the July 2017 compliance monitoring plan (CMP), groundwater samples are submitted to an Ecology-approved laboratory under a chain-of-custody and analyzed in accordance with following methods:

- Quarterly for:
  - Benzene by USEPA Method 8021B
  - Gasoline range organics (GRO) by Ecology Method NWTPH-Gx
  - Diesel range organics (DRO) and heavy-oil range organics (HO) by Ecology Method NWTPH-Dx (after silica gel cleanup)
  - Carcinogenic polyaromatic hydrocarbons (cPAHs) by USEPA Method 8270 SIM
- Biannually for:
  - Sulfate and nitrate by USEPA Method 300.0
  - Dissolved methane by USEPA Method RSK 175
  - Dissolved manganese by USEPA Method 200.8 (field filtered)
  - Ferrous iron (Hach field kit).

## DATA VALIDATION

The analytical data were reviewed to evaluate the usability of the data. The data validation process includes the following category:

- Data Completeness

- Holding Times and Preservation
- Blanks
- Deuterated Monitoring Compounds (Surrogates)
- Laboratory Control Samples/Laboratory Control Samples Duplicate (LCS/LCSD)
- Matrix Spike/Matrix Spike Duplicates (MS/MSD)
- Field Duplicates (FD)
- Laboratory Duplicates/Replicates (LR)

Groundwater samples were analyzed for benzene (USEPA method 8021B), GRO (Ecology method NWTPH-Gx), DRO/HO (Ecology method NWTPH-Dx after silica gel cleanup) and cPAHs (USEPA method 8270C SIM).

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer.

The data review process performed involved evaluating the following parameters: sample receipt, case narrative, holding times, method blank results, trip blank results, LCS/LCSD results, MS/MSD results, field and laboratory duplicate results and surrogate recoveries.

Each category is further described in the following sections.

### Data Completeness

Groundwater sample analyses were performed as requested on chain-of-custody documentation. The laboratory reported all requested water sample analyses and the deliverable data reports were complete.

### Holding Times and Preservation

All analyses were performed within the method-specified holding time. In addition, all samples were collected and preserved appropriately.

Holding time exceedance presented in the following table:

Field Sample ID	Analyte	Method	Holding Time	Date Sampled	Date of Analysis	Exceedance
NE	NE	NE	NE	NE	NE	NE

Notes:

NE: not encountered

### Blanks

Quality assurance (QA) blanks (i.e., method and field blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Laboratory method blanks measure laboratory contamination. Rinsate blanks measure contamination of samples during field operations by non-dedicated sampling equipment. Trip blanks measure contamination of samples during samples transportation.

#### Laboratory Method Blanks

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank (common laboratory contaminant compounds are calculated at ten times) is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

A method blank was analyzed for each method. No method blank contamination was detected.

Field sample ID qualified for blank contamination summarized in the following table:

Field Sample ID	Blank type	Method	Parameter	Unit	Blank Result	Sample Result	Validation Qualifier
NE	NE	NE	NE	NE	NE	NE	NE

#### *Rinsate Blank*

No rinsate blank is required since the equipment is dedicated to the sampling.

#### *Trip blank*

No detections were observed in the trip blank therefore no sample contamination is suspected during sample transportation and results are meeting QA requirements.

### Deuterated Monitoring Compounds (Surrogates)

Appropriate numbers of surrogate compounds were spiked into each sample for the USEPA method 8021B, USEPA method 8270C SIM, Ecology NWTPH-Gx and Ecology NWTPH-Dx. All surrogate compound recoveries were within the laboratory's acceptance criteria except for sample LM-2-W-180920 for method NWTPH-Dx. The surrogate recovery for method NWTPH-Dx analysis in batch number 182740022A was below the lower control limit (4%) and all associated sample results were qualified as estimated "UJ".

Field Sample IDs associated with surrogates exhibiting outside of control limits presented in the following table:

Field Sample ID	Surrogates	Recovery	Laboratory Limit
LM-2-W-180920	Orthoterphenyl	46%	50% - 150%

### Laboratory Control Sample/ Laboratory Control Sample Duplicates

LCSs were prepared in duplicate and analyzed. LCS and LCSD recoveries reported and the relative percent differences (RPDs) between the LCS and LCSD recoveries were within the laboratory's acceptance criteria besides for two cPAHs: benzo(a)anthracene and chrysene. The LCS recovery for benzo(a)anthracene was observed in the range of 3% to 6% high bias compared to the acceptance criteria in batches 18268WAB026 and 18269WAE026. The associated benzo(a)anthracene sample results were non-detect, therefore associated sample results were not qualified. The LCS recovery for chrysene was observed 6% high bias compared to the acceptance criteria in batch 18269WAE026. The associated chrysene detected sample result was qualified as J.

In addition, LCS/LCSD RPD for DRO in batch 182820002A was exceeded laboratory's acceptance criteria, however the associated sample result was non-detect, therefore associated sample results were not qualified.

Samples associated with LCS/LCSD exhibited recoveries outside the control limit presented in the following table:

Field Sample ID	Parameter	LCS Recovery	QC Limit	Validation Qualifier
MW-530-W-180920	Chrysene	115%	66% - 109%	J

Notes

J: the concentration is an approximate value

### Matrix spike/Matrix spike duplicates

Matrix spikes were prepared in duplicate and analyzed. MS and MSD analysis must exhibit a percent recoveries and relative percent differences within the laboratory's acceptance criteria.

The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where compound concentration detected in the parent sample exceeds the MS/MSD concentration by factor four.

MS/MSD was performed using sample MW-504-W-180920 and results were observed within acceptance criteria besides Chrysene and NWTPH-Gx water C7-C12 in SDG 1990016. The MS and/ or MSD recoveries for Chrysene was observed 1% and NWTPH-Gx water C7-C12 were observed in the range of 4% to 5% high bias compared to the acceptance criteria. The associated sample results were non-detect, therefore associated sample results were not qualified. In addition, The MS recovery for DX DRO C12-C24 was observed 2% low bias compared to the acceptance criteria. The associated sample results were non-detect, therefore associated sample results were qualified as UJ.

The MS/MSD was performed using sample MW-514-W-180920 and MW-530-W-180920 NWTPH-Gx water C7-C12, MS/MSD recoveries observed 2%/4% high bias compared to the acceptance criteria but sample results were not detected therefore, associated sample result was not qualified.

Samples associated with MS/MSD exhibited recoveries outside the control limit presented in the following table:

Field Sample ID	Parameter	MS Recovery	Validation Qualifier	Laboratory Limit
MW-504-W-180920	DX DRO C12-C24	28 %	UJ	30 %

Notes

UJ: the analyte was analyzed for, but was not detected and the reported quantitation limit is approximate

## Field Duplicates

Field duplicate was collected for SDG 1990016 and all precision criteria were met.

Duplicate sample ID and Parent field sample ID were updated in the following table:

Duplicate Sample ID	Field Sample ID
DUP-4-WD-180920	MW-101-W-180920

## Laboratory Duplicates

Laboratory duplicate was not performed for SDG 1990016.

## CONCLUSION

The objective of this validation memorandum is to demonstrate that sufficient number of representative samples were collected, and the resulting analytical data were acceptable according to the USEPA guidelines and the CMP requirements.

- Precision of the data was verified through the review of field and laboratory data quality indicators that include LCS/LCSD and MS/MSD RPDs. Precision was acceptable.
- Accuracy of the data was verified through the review of surrogate, LCS and MS recoveries. One sample result was qualified as estimated for low surrogate and MS recoveries. One sample result was qualified as estimated for high LCS recovery. The data is considered as valid. Accuracy was acceptable.
- Representativeness of the data was verified through the sample collection, storage and preservation procedures, verification of holding time compliance and evaluation of blank data. The laboratory did not note any discrepancies with sample collection, storage or preservation procedures. All data were reported from analyses within the recommended holding time. The method blank and trip blank samples were free of contamination with no qualification required.

- Comparability of the data was ensured through the use of standard analytical procedures and standard units for reporting. Results obtained are comparable to industry standards in that the collection and analytical techniques followed approved, documented procedures.
- Completeness is a measure of the number of valid measurements obtained in relation to the total number of measurements planned. Completeness is expressed as the percentage of valid or usable measurements compared to planned measurements. Valid data are defined as all data that are not rejected for project use. All data were considered valid. The completeness goal was met for all analytes.

## REFERENCES

Arcadis. 2017. Final Compliance Monitoring Plan. Former Unocal Edmonds Bulk Fuel Terminal. July 31.

USEPA 2017. National Functional Guidelines for Superfund Organic Methods Data Review (USEPA-540-R-2017-002). January.

## ATTACHMENTS

Table 1: Sample Summary

Table 2: Qualified Results Summary

**Table 1: Sample Summary**

<b>Field Sample ID</b>	<b>Laboratory Sample ID</b>	<b>Sample Date</b>	<b>Sample Time</b>	<b>Sample Purpose</b>
LM-2-W-180920	9815394	09/20/2018	05:45	Regular
MW-502-W-180920	9815395	09/20/2018	11:45	Regular
MW-503-W-180920	9815396	09/20/2018	10:30	Regular
MW-504-W-180920	9815397	09/20/2018	09:50	Regular
MW-505-W-180920	9815400	09/20/2018	09:55	Regular
MW-511-W-180920	9815401	09/20/2018	09:00	Regular
MW-512-W-180920	9815402	09/20/2018	12:15	Regular
MW-513-W-180920	9815403	09/20/2018	11:30	Regular
MW-514-W-180920	9815404	09/20/2018	11:10	Regular
MW-530-W-180920	9815405	09/20/2018	08:35	Regular
DUP-4-WD-180920	9815406	09/20/2018	NA	Field Duplicate
QA-T-180920	9815407	09/20/2018	NA	Trip Blank

Note:

NA: not applicable

**Table 2: Qualified Results Summary**

Laboratory Sample ID	Field Sample ID	Sample Purpose	SDG	Analytical Method	Parameter	Laboratory Result	Unit	Laboratory Qualifier	Validation Qualifier	Reason Code	Detect Flag
9815394	LM-2-W-180920	REG	1990016	Ecology NWTPH-Dx	DX DRO C12-C24	ND	ug/l	--	UJ	SURL	N
9815394	LM-2-W-180920	REG	190016	Ecology NWTPH-Dx	DX HRO C24-C40	ND	ug/l	--	UJ	SURL	N
9815397	MW-504-W-180920	REG	1990016	Ecology NWTPH-Dx	DX DRO C12-C24	ND	ug/l	--	UJ	MSL	N
9815405	MW-530-W-180920	REG	1990016	8270 D SIM	Chrysene	0.02	ug/l	--	J	LCSH	Y

Notes:

REG: regular

SDG: sample delivery group

SIM: selective ion monitoring

Ecology: Washington State Department of Ecology

DRO: diesel range organics reported as DX DRO C12-C24

HRO: Heavy oil range organics reported as DX HRO C24-C40

J: the concentration is an approximate value

UJ: the analyte was analyzed for, but was not detected and the reported quantitation limit is approximate

SURL: surrogate recovery below than lower acceptance limit

MSL:MS recovery was below the lower control limit

LCSH: LCS recovery was above the upper control limit

ug/L: micrograms per liter

ND: non-detect

N: analyte not detected



# Data Validation Memorandum

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<b>TO:</b>	Ophélie Encelle	<b>SDG:</b>	2012877
<b>FROM:</b>	Dilip Kumar	<b>SITE:</b>	Former Unocal Edmonds Bulk Fuel Terminal Edmonds, Washington
<b>DATE:</b>	February 13, 2019		

## INTRODUCTION

This report was prepared by Arcadis Consulting India Pvt Ltd for Arcadis U.S., Inc. (Arcadis) to provide a data validation of the analytical results for the groundwater samples collected at the former Union Oil Company of California Edmonds Bulk Fuel Terminal, located at 11720 Unoco Road, Edmonds, Washington (Site). Groundwater samples are collected and submitted to a Washington State Department of Ecology (Ecology) approved laboratory, Lancaster Laboratories Environmental.

Particularly, this report summarizes the level II data validation findings of the analytical results reported in the sample delivery group (SDG) 2012877 for 10 groundwater samples and 1 trip blank collected on November 27, 2018. The samples for analysis and qualified results are listed in Table 1 and Table 2. The data were reviewed in accordance with United States Environmental Protection Agency (USEPA. 2017), National Functional Guidelines for Superfund Organic Methods Data Review.

According to the July 2017 compliance monitoring plan (CMP), groundwater samples are submitted to an Ecology-approved laboratory under a chain-of-custody and analyzed in accordance with following methods:

- Quarterly for:
  - Benzene by USEPA Method 8021B
  - Gasoline range organics (GRO) by Ecology Method NWTPH-Gx
  - Diesel range organics (DRO) and heavy-oil range organics (HO) by Ecology Method NWTPH-Dx (after silica gel cleanup)
  - Carcinogenic polyaromatic hydrocarbons (cPAHs) by USEPA Method 8270 SIM
- Biannually for:
  - Sulfate and nitrate by USEPA Method 300.0
  - Dissolved methane by USEPA Method RSK 175
  - Dissolved manganese by USEPA Method 200.8 (field filtered)
  - Ferrous iron (Hach field kit).

## DATA VALIDATION

The analytical data were reviewed to evaluate the usability of the data. The data validation process includes the following category:

- Data Completeness
- Holding Times and Preservation

- Blanks
- Deuterated Monitoring Compounds (Surrogates)
- Laboratory Control Samples/Laboratory Control Samples Duplicate (LCS/LCSD)
- Matrix Spike/Matrix Spike Duplicates (MS/MSD)
- Field Duplicates (FD)
- Laboratory Duplicates/Replicates (LR)

Groundwater samples were analyzed for benzene (USEPA method 8021B), GRO (Ecology method NWTPH-Gx), DRO/HO (Ecology method NWTPH-Dx after silica gel cleanup) and cPAHs (USEPA method 8270D SIM), Manganese (USEPA 200.8), Methane (RSK 175), Sulfate and Nitrate Nitrogen (USEPA 300.0).

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer.

The data review process performed involved evaluating the following parameters: sample receipt, case narrative, holding times, method blank results, trip blank results, LCS/LCSD results, MS/MSD results, field and laboratory duplicate results and surrogate recoveries.

Each category is further described in the following sections.

### Data Completeness

Groundwater sample analyses were performed as requested on chain-of-custody documentation. The laboratory reported all requested water sample analyses and the deliverable data reports were complete.

### Holding Times and Preservation

All analyses were performed within the method-specified holding time. In addition, all samples were collected and preserved appropriately.

Holding time exceedance presented in the following table:

Field Sample ID	Analyte	Method	Holding Time	Date Sampled	Date of Analysis	Exceedance
NE	NE	NE	NE	NE	NE	NE

Notes:

NE: not encountered

### Blanks

Quality assurance (QA) blanks (i.e., method and field blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Laboratory method blanks measure laboratory contamination. Rinsate blanks measure contamination of samples during field operations by non-dedicated sampling equipment. Trip blanks measure contamination of samples during samples transportation.

#### Laboratory Method Blanks

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank (common laboratory contaminant compounds are calculated at ten times) is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

A method blank was analyzed for each method. No method blank contamination was detected.

Field sample ID qualified for blank contamination summarized in the following table:

Field Sample ID	Blank type	Method	Parameter	Unit	Blank Result	Sample Result	Validation Qualifier
NE	NE	NE	NE	NE	NE	NE	NE

#### *Rinsate Blank*

No rinsate blank is required since the equipment is dedicated to the sampling.

#### *Trip blank*

No detections were observed in the trip blank therefore no sample contamination is suspected during sample transportation and results are meeting QA requirements.

### Deuterated Monitoring Compounds (Surrogates)

Appropriate numbers of surrogate compounds were spiked into each sample for the USEPA method 8021B, USEPA method 8270D SIM, Ecology NWTPH-Gx and Ecology NWTPH-Dx. All surrogate compound recoveries were within the laboratory's acceptance criteria except for samples MW-525-W-181127 for method NWTPH-Dx and MW-526-W-181127 for method 8270D SIM. The surrogate recovery for method NWTPH-Dx analysis in batch number 183380003A was below the lower control limit (22%). Therefore, associated sample results were qualified as estimated "J" for detects and "UJ" for non-detects. The surrogate recovery for method 8270D SIM analysis in batch number 18333WAE026 was 123% above the higher control limit (119%).

Field Sample IDs associated with surrogates exhibiting outside of control limits presented in the following table:

Field Sample ID	Surrogates	Recovery	Laboratory Limit
MW-525-W-181127	Orthoterphenyl	28%	50% - 150%
MW-526-W-181127	Fluranthene-d10	242%	38%-119%

### Laboratory Control Sample/ Laboratory Control Sample Duplicates

LCSs were prepared in duplicate and analyzed. LCS and LCSD recoveries reported and the relative percent differences (RPDs) between the LCS and LCSD recoveries were within the laboratory's acceptance criteria.

Samples associated with LCS/LCSD exhibited recoveries outside the control limit presented in the following table:

Field Sample ID	Parameter	LCS Recovery	LCSD Recovery	RPD	RPD Limit	Validation Qualifier
NE	NE	NE	NE	NE	NE	NE

### Matrix spike/Matrix spike duplicates

Matrix spikes were prepared in duplicate and analyzed. MS and MSD analysis must exhibit a percent recoveries and relative percent differences within the laboratory's acceptance criteria.

The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where compound concentration detected in the parent sample exceeds the MS/MSD concentration by factor four.

MS/MSD was performed using samples LM-2-W-181127 and MW-104-W-181127 for manganese, results were observed within acceptance criteria.

MS/MSD was performed using samples MW-104-W-181127 for nitrate nitrogen and sulfate, results were observed within acceptance criteria.

Samples associated with MS/MSD exhibited recoveries outside the control limit presented in the following table:

Field Sample ID	Parameter	MS Recovery	Validation Qualifier	Laboratory Limit
NE	NE	NE	NE	NE

## Field Duplicates

Field duplicate was not collected for SDG 2012877.

## Laboratory Duplicates

Laboratory duplicate analysis was done using sample LM-2-W-181127 and MW-104-W-181127 for manganese. All precision criteria were met and acceptable.

The laboratory duplicate analysis was done using sample MW-104-W-181127 for nitrate nitrogen and sulfate. All precision criteria were met and acceptable.

## CONCLUSION

The objective of this validation memorandum is to demonstrate that sufficient number of representative samples were collected, and the resulting analytical data were acceptable according to the USEPA guidelines and the CMP requirements.

- Precision of the data was verified through the review of field and laboratory data quality indicators that include LCS/LCSD, MS/MSD and LR RPDs. Precision was acceptable.
- Accuracy of the data was verified through the review of surrogate, LCS and MS recoveries. Two sample results were qualified as estimated for low surrogate recoveries. The data is considered as valid. Accuracy was acceptable.
- Representativeness of the data was verified through the sample collection, storage and preservation procedures, verification of holding time compliance and evaluation of blank data. The laboratory did not note any discrepancies with sample collection, storage or preservation procedures. All data were reported from analyses within the recommended holding time. The method blank and trip blank samples were free of contamination with no qualification required.
- Comparability of the data was ensured through the use of standard analytical procedures and standard units for reporting. Results obtained are comparable to industry standards in that the collection and analytical techniques followed approved, documented procedures.
- Completeness is a measure of the number of valid measurements obtained in relation to the total number of measurements planned. Completeness is expressed as the percentage of valid or usable measurements compared to planned measurements. Valid data are defined as all data that are not rejected for project use. All data were considered valid. The completeness goal was met for all analytes.

## REFERENCES

Arcadis. 2017. Final Compliance Monitoring Plan. Former Unocal Edmonds Bulk Fuel Terminal. July 31.

## **ATTACHMENTS**

Table 1: Sample Summary

Table 2: Qualified Results Summary

**Table 1: Sample Summary**

<b>Field Sample ID</b>	<b>Laboratory Sample ID</b>	<b>Sample Date</b>	<b>Sample Time</b>	<b>Sample Purpose</b>
LM-2-W-181127	9914791	11/27/2018	14:25	Regular
MW-104-W-181127	9914792	11/27/2018	11:15	Regular
MW-525-W-181127	9914793	11/27/2018	10:35	Regular
MW-526-W-181127	9914794	11/27/2018	09:00	Regular
MW-530-W-181127	9914795	11/27/2018	13:40	Regular
MW-531-W-181127	9914796	11/27/2018	10:25	Regular
MW-532-W-181127	9914797	11/27/2018	10:30	Regular
MW-533-W-181127	9914798	11/27/2018	11:30	Regular
MW-535-W-181127	9914799	11/27/2018	11:20	Regular
MW-ER-W-181127	9914800	11/27/2018	12:35	Regular
QA-T-181127	9914801	11/27/2018	NA	Trip Blank

Note:

NA: not applicable

**Table 2: Qualified Results Summary**

Laboratory Sample ID	Field Sample ID	Sample Purpose	SDG	Analytical Method	Parameter	Laboratory Result	Unit	Laboratory Qualifier	Validation Qualifier	Reason Code	Detect Flag
9914793	MW-525-W-181127	REG	2012877	Ecology NWTPH-Dx	DRO	130	ug/l	--	J	SURL	Y
9914793	MW-525-W-181127	REG	2012877	Ecology NWTPH-Dx	HRO	ND	ug/l	--	UJ	SURL	N
9914794	MW-526-W-181127	REG	2012877	SW-846 8270D SIM	Benzo(a)Pyrene	0.04	ug/L	--	J	SURH	Y
9914794	MW-526-W-181127	REG	2012877	SW-846 8270D SIM	Indeno(1,2,3-cd)pyrene	0.02	ug/L	--	J	SURH	Y

Notes:

REG: regular

SDG: sample delivery group

Ecology: Washington State Department of Ecology

DRO: diesel range organics reported as DX DRO C12-C24

HRO: Heavy oil range organics reported as DX HRO C24-C40

J: the concentration is an approximate value

UJ: the analyte was analyzed for, but was not detected and the reported quantitation limit is approximate

SURL: surrogate recovery below acceptance limit

SURH: surrogate recovery above acceptance limit

ug/L: micrograms per liter

ND: non-detect

Y: analyte detected

N: analyte not detected

# Data Validation Memorandum

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<b>TO:</b>	Ophélie Encelle	<b>SDG:</b>	2013349
<b>FROM:</b>	Dilip Kumar	<b>SITE:</b>	Former Unocal Edmonds Bulk Fuel Terminal Edmonds, Washington
<b>DATE:</b>	February 13, 2019		

## INTRODUCTION

This report was prepared by Arcadis Consulting India Pvt Ltd for Arcadis U.S., Inc. (Arcadis) to provide a data validation of the analytical results for the groundwater samples collected at the former Union Oil Company of California Edmonds Bulk Fuel Terminal, located at 11720 Unoco Road, Edmonds, Washington (Site). Groundwater samples are collected and submitted to a Washington State Department of Ecology (Ecology) approved laboratory, Lancaster Laboratories Environmental.

Particularly, this report summarizes the level II data validation findings of the analytical results reported in the sample delivery group (SDG) 2013349 for 14 groundwater samples, 2 field duplicate and 1 trip blank collected on November 28, 2018. Matrix spike/matrix spike duplicate (MS/MSD) was requested for 1 groundwater sample. The samples for analysis and qualified results are listed in Table 1 and Table 2. The data were reviewed in accordance with United States Environmental Protection Agency (USEPA, 2017), National Functional Guidelines for Superfund Organic Methods Data Review.

According to the July 2017 compliance monitoring plan (CMP), groundwater samples are submitted to an Ecology-approved laboratory under a chain-of-custody and analyzed in accordance with following methods:

- Quarterly for:
  - Benzene by USEPA Method 8021B
  - Gasoline range organics (GRO) by Ecology Method NWTPH-Gx
  - Diesel range organics (DRO) and heavy-oil range organics (HO) by Ecology Method NWTPH-Dx (after silica gel cleanup)
  - Carcinogenic polyaromatic hydrocarbons (cPAHs) by USEPA Method 8270 SIM
- Biannually for:
  - Sulfate and nitrate by USEPA Method 300.0
  - Dissolved methane by USEPA Method RSK 175
  - Dissolved manganese by USEPA Method 200.8 (field filtered)
  - Ferrous iron (Hach field kit).

## DATA VALIDATION

The analytical data were reviewed to evaluate the usability of the data. The data validation process includes the following category:

- Data Completeness



- Holding Times and Preservation
- Blanks
- Deuterated Monitoring Compounds (Surrogates)
- Laboratory Control Samples/Laboratory Control Samples Duplicate (LCS/LCSD)
- Matrix Spike/Matrix Spike Duplicates (MS/MSD)
- Field Duplicates (FD)
- Laboratory Duplicates/Replicates (LR)

Groundwater samples were analyzed for benzene (USEPA method 8021B), GRO (Ecology method NWTPH-Gx), DRO/HO (Ecology method NWTPH-Dx after silica gel cleanup), cPAHs (USEPA method 8270D SIM), Manganese (USEPA 200.8), Methane (RSK 175), Sulfate and Nitrate Nitrogen (USEPA 300.0).

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer.

The data review process performed involved evaluating the following parameters: sample receipt, case narrative, holding times, method blank results, trip blank results, LCS/LCSD results, MS/MSD results, field and laboratory duplicate results and surrogate recoveries.

Each category is further described in the following sections.

### Data Completeness

Groundwater sample analyses were performed as requested on chain-of-custody documentation. The laboratory reported all requested water sample analyses and the deliverable data reports were complete.

### Holding Times and Preservation

All analyses were performed within the method-specified holding time. In addition, all samples were collected and preserved appropriately.

Holding time exceedance presented in the following table:

Field Sample ID	Method	Holding Time	Date Sampled	Date of Analysis	Exceedance
NE	NE	NE	NE	NE	NE

Note:

NE: not encountered

### Blanks

Quality assurance (QA) blanks (i.e., method and field blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Laboratory method blanks measure laboratory contamination. Rinsate blanks measure contamination of samples during field operations by non-dedicated sampling equipment. Trip blanks measure contamination of samples during samples transportation.

#### Laboratory Method Blanks

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank (common laboratory contaminant compounds are calculated at ten times) is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

A method blank was analyzed for each method. No method blank contamination was detected.

Field sample ID qualified for blank contamination summarized in the following table:

Field Sample ID	Blank type	Method	Parameter	Unit	Blank Result	Sample Result	Validation Qualifier
NE	NE	NE	NE	NE	NE	NE	NE

#### *Rinsate Blank*

No rinsate blank is required since the equipment is dedicated to the sampling.

#### *Trip blank*

No detections were observed in the trip blank therefore no sample contamination is suspected during sample transportation and results are meeting QA requirements.

### Deuterated Monitoring Compounds (Surrogates)

Appropriate numbers of surrogate compounds were spiked into each sample for the USEPA method 8021B, USEPA method 8270D SIM, Ecology NWTPH-Gx and Ecology NWTPH-Dx. All surrogate compound recoveries were within the laboratory's acceptance criteria except for sample MW-ER-W-181128. The surrogate recovery for method 8270D SIM analysis in batch number 18338WAF026 was 2% above the higher control limit (119). All associated sample results were qualified as estimated "J" for detections.

Field Sample IDs associated with surrogates exhibiting outside of control limits presented in the following table:

Field Sample ID	Surrogates	Recovery (%)	Laboratory Limit (%)
MW-ER-W-181128	Fluranthene-d10	121	38-119

### Laboratory Control Sample/ Laboratory Control Sample Duplicates

LCSs were prepared in duplicate and analyzed. LCS and LCSD recoveries reported and the relative percent differences (RPDs) between the LCS and LCSD recoveries were within the laboratory's acceptance criteria besides DRO. The LCS/LCSD RPD for DRO in batch 183380027A was exceeded laboratory's acceptance criteria. The associated detected sample result was qualified as estimated "J".

Samples associated with LCS/LCSD exhibited recoveries outside the control limit presented in the following table:

Field Sample ID	Parameter	LCS Recovery %	LCSD Recovery %	RPD	RPD Limit	Validation Qualifier
MW-129R-W-181128	DRO	39	31	24	20	J

Notes:

DRO: diesel range organics reported as DX DRO C12-C24

J: the concentration is an approximate value

### Matrix spike/Matrix spike duplicates

Matrix spikes were prepared in duplicate and analyzed. MS and MSD analysis must exhibit a percent recoveries and relative percent differences within the laboratory's acceptance criteria.

The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where compound concentration detected in the parent sample exceeds the MS/MSD concentration by factor four.

MS/MSD was performed using sample MW-507-W-181128 and results were observed within acceptance criteria besides for GRO, methane and manganese. The MSD recovery for methane observed 6% low bias

compared to the acceptance criteria, therefore associated sample results were qualified as “J”. The MS recovery for manganese was observed 16% high bias compared to the acceptance criteria, therefore associated sample results were qualified as “J”. MS/MSD recoveries for GRO were observed 5% high bias compared to the acceptance criteria but sample result was not detected, therefore associated sample result was not qualified.

Samples associated with MS/MSD exhibited recoveries outside the control limit presented in the following table:

Field Sample ID	Parameter	MS Recovery %	MSD Recovery %	Validation Qualifier	Laboratory Limit
MW-507-W-181128	Methane	77	67	J	73-125
MW-507-W-181128	Manganese	146	NA	J	70-130

Notes:

J: estimated

NA: not analyzed

### Field Duplicates

Field duplicate was collected for SDG 2013349 and all precision criteria were met except for methane (35.3) in samples MW-534-W-181128/DUP-1-WD-181128 exhibited RPDs greater than 20%. The associated sample results were qualified as J.

Duplicate sample ID and Parent field sample ID were updated in the following table:

Duplicate Sample ID	Field Sample ID
DUP-1-WD-181128	MW-534-W-181128
DUP-2-WD-181128	MW-515-W-181128

### Laboratory Duplicates

Laboratory duplicate analysis was done using sample MW-507-W-181128 for manganese. All precision criteria were met and acceptable.

Laboratory duplicate analysis was done using sample MW-507-W-181128 and MW-518-W-181128 for nitrate nitrogen and sulfate. All precision criteria were met and acceptable.

## CONCLUSION

The objective of this validation memorandum is to demonstrate that sufficient number of representative samples were collected, and the resulting analytical data were acceptable according to the USEPA guidelines and the CMP requirements.

- Precision of the data was verified through the review of field and laboratory data quality indicators that include LCS/LCSD, MS/MSD, FD and LR RPDs. One FD and LCS/LCSD RPD results exceeded RPD criteria and results were qualified as estimated. The data is considered as valid. Precision was acceptable.
- Accuracy of the data was verified through the review of surrogate, LCS and MS recoveries. One sample result was qualified as estimated for MS high recovery. One sample result was qualified as estimated for low MSD recovery. The data is considered as valid. Accuracy was acceptable.
- Representativeness of the data was verified through the sample collection, storage and preservation procedures, verification of holding time compliance and evaluation of blank data. The laboratory did not note any discrepancies with sample collection, storage or preservation procedures. All data were

reported from analyses within the recommended holding time. The method blank and trip blank samples were free of contamination with no qualification required.

- Comparability of the data was ensured through the use of standard analytical procedures and standard units for reporting. Results obtained are comparable to industry standards in that the collection and analytical techniques followed approved, documented procedures.
- Completeness is a measure of the number of valid measurements obtained in relation to the total number of measurements planned. Completeness is expressed as the percentage of valid or usable measurements compared to planned measurements. Valid data are defined as all data that are not rejected for project use. All data were considered valid. The completeness goal was met for all analytes.

## REFERENCES

Arcadis. 2017. Final Compliance Monitoring Plan. Former Unocal Edmonds Bulk Fuel Terminal. July 31.

USEPA 2017. National Functional Guidelines for Superfund Organic Methods Data Review (USEPA-540-R-2017-002). January.

## ATTACHMENTS

Table 1: Sample Summary

Table 2: Qualified Results Summary

**Table 1: Sample Summary**

<b>Field Sample ID</b>	<b>Laboratory Sample ID</b>	<b>Sample Date</b>	<b>Sample Time</b>	<b>Sample Purpose</b>
MW-101-W-181128	9916719	11/28/2018	12:45	Regular
MW-129R-W-181128	9916720	11/28/2018	08:45	Regular
MW-139R-W-181128	9916721	11/28/2018	11:50	Regular
MW-502-W-181128	9916722	11/28/2018	11:30	Regular
MW-503-W-181128	9916723	11/28/2018	09:55	Regular
MW-504-W-181128	9916724	11/28/2018	10:10	Regular
MW-505-W-181128	9916725	11/28/2018	11:06	Regular
MW-506-W-181128	9916726	11/28/2018	10:30	Regular
MW-507-W-181128	9916727	11/28/2018	08:35	Regular
MW-509-W-181128	9916731	11/28/2018	11:00	Regular
MW-515-W-181128	9916732	11/28/2018	12:40	Regular
MW-518-W-181128	9916733	11/28/2018	12:05	Regular
MW-534-W-181128	9916734	11/28/2018	08:30	Regular
DUP-1-WD-181128	9916735	11/28/2018	NA	Field Duplicate
DUP-2-WD-181128	9916736	11/28/2018	NA	Field Duplicate
QA-T-181128	9916737	11/28/2018	NA	Trip Blank
MW-ER-W-181128	9916738	11/28/2018	12:35	Regular

Note:  
NA: not applicable

**Table 2: Qualified Results Summary**

Laboratory Sample ID	Field Sample ID	Sample Purpose	SDG	Analytical Method	Parameter	Laboratory Result	Unit	Laboratory Qualifier	Validation Qualifier	Reason Code	Detect Flag
9916720	MW-129R-W-181128	REG	2013349	Ecology NWTPH-DX	DRO	550	ug/l	--	J	LCSP	Y
9916727	MW-507-W-181128	REG	2013349	RSK 175	Methane	3.9	ug/l	--	J	MSDL	Y
9916727	MW-507-W-181128	REG	2013349	EPA 200.8	Manganese	83.5	ug/l	--	J	MSH	Y
9916734	MW-534-W-181128	REG	2013349	RSK 175	Methane	140	ug/l	--	J	FD	Y
9916735	DUP-1-WD-181128	FD	2013349	RSK 175	Methane	200	ug/l	--	J	FD	Y

Notes:

REG: regular

FD: field duplicate

SDG: sample delivery group

Ecology: Washington State Department of Ecology

EPA: environmental protection agency

DRO: diesel range organics reported as DX DRO C12-C24

J: the concentration is an approximate value

MSH: MS recovery was above the upper control limit

MSDL: MSD recovery was below the lower control limit

FD: field duplicate exceeded RPD

LCSP: laboratory control sample exceeded RPD

ug/L: micrograms per liter

Y: analyte detected

# Data Validation Memorandum

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<b>TO:</b>	Ophélie Encelle	<b>SDG:</b>	2013846
<b>FROM:</b>	Dilip Kumar	<b>SITE:</b>	Former Unocal Edmonds Bulk Fuel Terminal Edmonds, Washington
<b>DATE:</b>	February 13, 2019		

## INTRODUCTION

This report was prepared by Arcadis Consulting India Pvt Ltd for Arcadis U.S., Inc. (Arcadis) to provide a data validation of the analytical results for the groundwater samples collected at the former Union Oil Company of California Edmonds Bulk Fuel Terminal, located at 11720 Unoco Road, Edmonds, Washington (Site). Groundwater samples are collected and submitted to a Washington State Department of Ecology (Ecology) approved laboratory, Lancaster Laboratories Environmental.

Particularly, this report summarizes the level II data validation findings of the analytical results reported in the sample delivery group (SDG) 2013846 for 11 groundwater samples, 1 field duplicate and 1 trip blank collected on November 29, 2018. Matrix spike/matrix spike duplicate (MS/MSD) was requested for 1 groundwater sample. The samples for analysis and qualified results are listed in Table 1 and Table 2. The data were reviewed in accordance with United States Environmental Protection Agency (USEPA, 2017), National Functional Guidelines for Superfund Organic Methods Data Review.

According to the July 2017 compliance monitoring plan (CMP), groundwater samples are submitted to an Ecology-approved laboratory under a chain-of-custody and analyzed in accordance with following methods:

- Quarterly for:
  - Benzene by USEPA Method 8021B
  - Gasoline range organics (GRO) by Ecology Method NWTPH-Gx
  - Diesel range organics (DRO) and heavy-oil range organics (HO) by Ecology Method NWTPH-Dx (after silica gel cleanup)
  - Carcinogenic polyaromatic hydrocarbons (cPAHs) by USEPA Method 8270 SIM
- Biannually for:
  - Sulfate and nitrate by USEPA Method 300.0
  - Dissolved methane by USEPA Method RSK 175
  - Dissolved manganese by USEPA Method 200.8 (field filtered)
  - Ferrous iron (Hach field kit).

## DATA VALIDATION

The analytical data were reviewed to evaluate the usability of the data. The data validation process includes the following category:

- Data Completeness

- Holding Times and Preservation
- Blanks
- Deuterated Monitoring Compounds (Surrogates)
- Laboratory Control Samples/Laboratory Control Samples Duplicate (LCS/LCSD)
- Matrix Spike/Matrix Spike Duplicates (MS/MSD)
- Field Duplicates (FD)
- Laboratory Duplicates/Replicates (LR)

Groundwater samples were analyzed for benzene (USEPA method 8021B), GRO (Ecology method NWTPH-Gx), DRO/HO (Ecology method NWTPH-Dx after silica gel cleanup), cPAHs (USEPA method 8270D SIM), Manganese (USEPA 200.8), Methane (RSK 175), Sulfate and Nitrate Nitrogen (USEPA 300.0).

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer.

The data review process performed involved evaluating the following parameters: sample receipt, case narrative, holding times, method blank results, trip blank results, LCS/LCSD results, MS/MSD results, field or laboratory duplicate results and surrogate recoveries.

Each category is further described in the following sections.

### Data Completeness

Groundwater sample analyses were performed as requested on chain-of-custody documentation. The laboratory reported all requested water sample analyses and the deliverable data reports were complete.

### Holding Times and Preservation

All analyses were performed within the method-specified holding time. In addition, all samples were collected and preserved appropriately.

Holding time exceedance presented in the following table:

Field Sample ID	Method	Holding Time	Date Sampled	Date of Analysis	Exceedance
NE	NE	NE	NE	NE	NE

Note:

NE: not encountered

### Blanks

Quality assurance (QA) blanks (i.e., method and field blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Laboratory method blanks measure laboratory contamination. Rinsate blanks measure contamination of samples during field operations by non-dedicated sampling equipment. Trip blanks measure contamination of samples during samples transportation.

#### Laboratory Method Blanks

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank (common laboratory contaminant compounds are calculated at ten times) is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.



A method blank was analyzed for each method. No method blank contamination was detected.

Field sample ID qualified for blank contamination summarized in the following table:

Field Sample ID	Blank type	Method	Parameter	Unit	Blank Result	Sample Result	Validation Qualifier
NE	NE	NE	NE	NE	NE	NE	NE

#### *Rinsate Blank*

No rinsate blank is required since the equipment is dedicated to the sampling.

#### *Trip blank*

No detections were observed in the trip blank therefore no sample contamination is suspected during sample transportation and results are meeting QA requirements.

### Deuterated Monitoring Compounds (Surrogates)

Appropriate numbers of surrogate compounds were spiked into each sample for the USEPA method 8021B, USEPA method 8270D SIM, Ecology NWTPH-Gx and Ecology NWTPH-Dx. All surrogate compound recoveries were within the laboratory's acceptance criteria.

Field Sample IDs associated with surrogates exhibiting outside of control limits presented in the following table:

Field Sample ID	Surrogates	Recovery (%)	Laboratory Limit (%)
NE	NE	NE	NE

### Laboratory Control Sample/ Laboratory Control Sample Duplicates

LCSs were prepared in duplicate and analyzed. LCS and LCSD recoveries reported and the relative percent differences (RPDs) between the LCS and LCSD recoveries were within the laboratory's acceptance criteria besides DRO. The LCS/LCSD RPD for DRO in batch 183380027A exceeded laboratory's acceptance criteria. The associated sample results were non-detects, therefore associated sample result was not qualified.

Samples associated with LCS/LCSD exhibited recoveries outside the control limit presented in the following table:

Field Sample ID	Parameter	LCS Recovery %	LCSD Recovery %	RPD	RPD Limit	Validation Qualifier
NE	NE	NE	NE	NE	NE	NE

### Matrix spike/Matrix spike duplicates

Matrix spikes were prepared in duplicate and analyzed. MS and MSD analysis must exhibit a percent recoveries and relative percent differences within the laboratory's acceptance criteria.

The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where compound concentration detected in the parent sample exceeds the MS/MSD concentration by factor four.

MS/MSD was performed using samples MW-512-W-181129 and MW-517-W-181129.

Results were observed outside of acceptance criteria for nitrate nitrogen and sulfate for MW-512-W-181129. The MS recoveries for nitrate nitrogen and sulfate observed 2% and 13% respectively high bias, therefore associated sample results were qualified as "J".

Results were observed within acceptance criteria besides for GRO for MW-517-W-181129, MS/MSD recoveries observed 4%/5% high bias compared to the acceptance criteria, but sample result was not detected therefore, associated sample result was not qualified.

Samples associated with MS/MSD exhibited recoveries outside the control limit presented in the following table:

Field Sample ID	Parameter	MS Recovery %	MSD Recovery %	Validation Qualifier	Laboratory Limit
MW-512-W-181129	Nitrate Nitrogen	112	NA	J	90-110
MW-512-W-181129	sulfate	133	NA	J	90-110

Notes:

J: estimated

NA: not analyzed

### Field Duplicates

Field duplicate was collected using sample MW-20R-W-181129 and all precision criteria were met.

Duplicate sample ID and Parent field sample ID were updated in the following table:

Duplicate Sample ID	Field Sample ID
DUP-3-WD-181129	MW-20R-W-181129

### Laboratory Duplicates

Laboratory duplicate analysis for manganese was done using sample MW-517-W-181129 and MW-512-W-181129. All precision criteria were met and acceptable.

The laboratory duplicate analyses for nitrate nitrogen and sulfate were done using sample MW-517-W-181129 and MW-512-W-181129. All precision criteria were met and acceptable besides for nitrate nitrogen in sample MW-512-W-181129. Nitrate nitrogen in sample MW-512-W-181129 exhibited RPDs greater than 20%. The associated sample results were qualified as J.

## CONCLUSION

The objective of this validation memorandum is to demonstrate that sufficient number of representative samples were collected, and the resulting analytical data were acceptable according to the USEPA guidelines and the CMP requirements.

- Precision of the data was verified through the review of field and laboratory data quality indicators that include LCS/LCSD, MS/MSD, FD and LR RPDs. One sample result was qualified as estimated for LR RPD exceedance. The data is considered as valid. Precision was acceptable.
- Accuracy of the data was verified through the review of surrogate, LCS and MS recoveries. Two sample results qualified as estimated for MS high recovery. The data is considered as valid. Accuracy was acceptable.
- Representativeness of the data was verified through the sample collection, storage and preservation procedures, verification of holding time compliance and evaluation of blank data. The laboratory did not note any discrepancies with sample collection, storage or preservation procedures. All data were reported from analyses within the recommended holding time. The method blank and trip blank samples were free of contamination with no qualification required.

- Comparability of the data was ensured through the use of standard analytical procedures and standard units for reporting. Results obtained are comparable to industry standards in that the collection and analytical techniques followed approved, documented procedures.
- Completeness is a measure of the number of valid measurements obtained in relation to the total number of measurements planned. Completeness is expressed as the percentage of valid or usable measurements compared to planned measurements. Valid data are defined as all data that are not rejected for project use. All data were considered valid. The completeness goal was met for all analytes.

## REFERENCES

Arcadis. 2017. Final Compliance Monitoring Plan. Former Unocal Edmonds Bulk Fuel Terminal. July 31.

USEPA 2017. National Functional Guidelines for Superfund Organic Methods Data Review (USEPA-540-R-2017-002). January.

## ATTACHMENTS

Table 1: Sample Summary

Table 2: Qualified Results Summary

**Table 1: Sample Summary**

<b>Field Sample ID</b>	<b>Laboratory Sample ID</b>	<b>Sample Date</b>	<b>Sample Time</b>	<b>Sample Purpose</b>
MW-8R-W-181129	9918764	11/29/2018	12:20	Regular
MW-20R-W-181129	9918765	11/29/2018	11:35	Regular
MW-511-W-181129	9918766	11/29/2018	08:35	Regular
MW-513-W-181129	9918767	11/29/2018	10:55	Regular
MW-514-W-181129	9918768	11/29/2018	11:30	Regular
MW-516-W-181129	9918769	11/29/2018	09:50	Regular
MW-517-W-181129	9918770	11/29/2018	10:00	Regular
MW-519-W-181129	9918774	11/29/2018	12:30	Regular
MW-520-W-181129	9918775	11/29/2018	12:10	Regular
MW-522-W-181129	9918776	11/29/2018	11:40	Regular
MW-512-W-181129	9918777	11/29/2018	10:15	Regular
DUP-3-WD-181129	9918778	11/29/2018	NA	Field Duplicate
QA-T-181129	9918779	11/29/2018	NA	Trip Blank

Note:

NA: not applicable

**Table 2: Qualified Results Summary**

Laboratory Sample ID	Field Sample ID	Sample Purpose	SDG	Analytical Method	Parameter	Laboratory Result	Unit	Laboratory Qualifier	Validation Qualifier	Reason Code	Detect Flag
9918777	MW-512-W-181129	REG	2013846	EPA 300.0	Nitrate Nitrogen	320	ug/l	--	J	MSH, LR	Y
9918777	MW-512-W-181129	REG	2013846	EPA 300.0	Sulfate	38,700	ug/l	--	J	MSH	Y

Notes:

REG: regular

SDG: sample delivery group

EPA: environmental protection agency

J: the concentration is an approximate value

MSH: Matrix Spike recovery was above the upper control limit

LR : Laboratory replicate (duplicate). Relative percent difference between original and laboratory duplicate was exceeded more than 20%.

ug/L: micrograms per liter

Y: analyte detected

# Data Validation Memorandum

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<b>TO:</b>	Ophélie Encelle	<b>SDG:</b>	2014142
<b>FROM:</b>	Dilip Kumar	<b>SITE:</b>	Former Unocal Edmonds Bulk Fuel Terminal Edmonds, Washington
<b>DATE:</b>	February 13, 2019		

## INTRODUCTION

This report was prepared by Arcadis Consulting India Pvt Ltd for Arcadis U.S., Inc. (Arcadis) to provide a data validation of the analytical results for the groundwater samples collected at the former Union Oil Company of California Edmonds Bulk Fuel Terminal, located at 11720 Unoco Road, Edmonds, Washington (Site). Groundwater samples are collected and submitted to a Washington State Department of Ecology (Ecology) approved laboratory, Lancaster Laboratories Environmental.

Particularly, this report summarizes the level II data validation findings of the analytical results reported in the sample delivery group (SDG) 2014142 for 3 groundwater samples, 1 field duplicate and 1 trip blank collected on November 30, 2018. The samples for analysis and qualified results are listed in Table 1 and Table 2. The data were reviewed in accordance with United States Environmental Protection Agency (USEPA. 2017), National Functional Guidelines for Superfund Organic Methods Data Review.

According to the July 2017 compliance monitoring plan (CMP), groundwater samples are submitted to an Ecology-approved laboratory under a chain-of-custody and analyzed in accordance with following methods:

- Quarterly for:
  - Benzene by USEPA Method 8021B
  - Gasoline range organics (GRO) by Ecology Method NWTPH-Gx
  - Diesel range organics (DRO) and heavy-oil range organics (HO) by Ecology Method NWTPH-Dx (after silica gel cleanup)
  - Carcinogenic polyaromatic hydrocarbons (cPAHs) by USEPA Method 8270 SIM
- Biannually for:
  - Sulfate and nitrate by USEPA Method 300.0
  - Dissolved methane by USEPA Method RSK 175
  - Dissolved manganese by USEPA Method 200.8 (field filtered)
  - Ferrous iron (Hach field kit).

## DATA VALIDATION

The analytical data were reviewed to evaluate the usability of the data. The data validation process includes the following category:

- Data Completeness
- Holding Times and Preservation

- Blanks
- Deuterated Monitoring Compounds (Surrogates)
- Laboratory Control Samples/Laboratory Control Samples Duplicate (LCS/LCSD)
- Matrix Spike/Matrix Spike Duplicates (MS/MSD)
- Field Duplicates (FD)
- Laboratory Duplicates/Replicates (LR)

Groundwater samples were analyzed for benzene (USEPA method 8021B), GRO (Ecology method NWTPH-Gx), DRO/HO (Ecology method NWTPH-Dx after silica gel cleanup), cPAHs (USEPA method 8270D SIM), Manganese (USEPA 200.8), Methane (RSK 175), Sulfate and Nitrate Nitrogen (USEPA 300.0).

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer.

The data review process performed involved evaluating the following parameters: sample receipt, case narrative, holding times, method blank results, trip blank results, LCS/LCSD results, MS/MSD results, field and laboratory duplicate results and surrogate recoveries.

Each category is further described in the following sections.

### Data Completeness

Groundwater sample analyses were performed as requested on chain-of-custody documentation. The laboratory reported all requested water sample analyses and the deliverable data reports were complete.

### Holding Times and Preservation

All analyses were performed within the method-specified holding time. In addition, all samples were collected and preserved appropriately.

Holding time exceedance presented in the following table:

Field Sample ID	Method	Holding Time	Date Sampled	Date of Analysis	Exceedance
NE	NE	NE	NE	NE	NE

Note:

NE: not encountered

### Blanks

Quality assurance (QA) blanks (i.e., method and field blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Laboratory method blanks measure laboratory contamination. Rinsate blanks measure contamination of samples during field operations by non-dedicated sampling equipment. Trip blanks measure contamination of samples during samples transportation.

#### Laboratory Method Blanks

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank (common laboratory contaminant compounds are calculated at ten times) is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

A method blank was analyzed for each method. No method blank contamination was detected.

Field sample ID qualified for blank contamination summarized in the following table:

Field Sample ID	Blank type	Method	Parameter	Unit	Blank Result	Sample Result	Validation Qualifier
NE	NE	NE	NE	NE	NE	NE	NE

#### *Rinsate Blank*

No rinsate blank is required since the equipment is dedicated to the sampling.

#### *Trip blank*

No detections were observed in the trip blank therefore no sample contamination is suspected during sample transportation and results are meeting QA requirements.

### Deuterated Monitoring Compounds (Surrogates)

Appropriate numbers of surrogate compounds were spiked into each sample for the USEPA method 8021B, USEPA method 8270D SIM, Ecology NWTPH-Gx and Ecology NWTPH-Dx. All surrogate compound recoveries were within the laboratory's acceptance criteria.

Field Sample IDs associated with surrogates exhibiting outside of control limits presented in the following table:

Field Sample ID	Surrogates	Recovery (%)	Laboratory Limit (%)
NE	NE	NE	NE

### Laboratory Control Sample/ Laboratory Control Sample Duplicates

LCSs were prepared in duplicate and analyzed. LCS and LCSD recoveries reported and the relative percent differences (RPDs) between the LCS and LCSD recoveries were within the laboratory's acceptance criteria.

Samples associated with LCS/LCSD exhibited recoveries outside the control limit presented in the following table:

Field Sample ID	Parameter	LCS Recovery %	LCSD Recovery %	RPD	RPD Limit	Validation Qualifier
NE	NE	NE	NE	NE	NE	NE

### Matrix spike/Matrix spike duplicates

Matrix spikes were prepared in duplicate and analyzed. MS and MSD analysis must exhibit a percent recoveries and relative percent differences within the laboratory's acceptance criteria.

The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where compound concentration detected in the parent sample exceeds the MS/MSD concentration by factor four.

MS was performed for sulfate and nitrate nitrogen using sample MW-126-W-181130 and results were observed within acceptance criteria besides for sulfate. MS was performed for manganese using sample DUP-4-WD-181130 and results were observed within acceptance criteria. The MS recovery for sulfate was observed with a 4% high bias, therefore associated sample result was qualified as "J". MW-126-W-181130 being the parent sample for the field duplicate DUP-4-WD-181130, the field duplicate DUP-4-WD-181130 sulfate result was also qualified as "J".

Samples associated with MS/MSD exhibited recoveries outside the control limit presented in the following table:



Field Sample ID	Parameter	MS Recovery %	MSD Recovery %	Validation Qualifier	Laboratory Limit %
MW-126-W-181130/ DUP-4-WD-181130	Sulfate	114	NA	J	90-110

Notes:

J: the concentration is an approximate value

NA: not analyzed

### Field Duplicates

Field duplicate was collected for SDG 2014142 and all and all precision criteria were met.

Duplicate sample ID and Parent field sample ID were updated in the following table:

Duplicate Sample ID	Field Sample ID
DUP-4-WD-181130	MW-126-W-181130

### Laboratory Duplicates

Laboratory duplicate analysis was done sample DUP-4-WD-181130 for manganese. All precision criteria were met and acceptable.

Laboratory duplicate analysis was done sample MW-126-W-181130 for nitrate nitrogen and sulfate. All precision criteria were met and acceptable.

## CONCLUSION

The objective of this validation memorandum is to demonstrate that sufficient number of representative samples were collected, and the resulting analytical data were acceptable according to the USEPA guidelines and the CMP requirements.

- Precision of the data was verified through the review of field and laboratory data quality indicators that include LCS/LCSD, MS/MSD, FD and LR RPDs. The data is considered as valid. Precision was acceptable.
- Accuracy of the data was verified through the review of surrogate, LCS and MS recoveries. Two sample results were qualified as estimated for MS high recovery. The data is considered as valid. Accuracy was acceptable.
- Representativeness of the data was verified through the sample collection, storage and preservation procedures, verification of holding time compliance and evaluation of blank data. The laboratory did not note any discrepancies with sample collection, storage or preservation procedures. All data were reported from analyses within the recommended holding time. The method blank and trip blank samples were free of contamination with no qualification required.
- Comparability of the data was ensured through the use of standard analytical procedures and standard units for reporting. Results obtained are comparable to industry standards in that the collection and analytical techniques followed approved, documented procedures.
- Completeness is a measure of the number of valid measurements obtained in relation to the total number of measurements planned. Completeness is expressed as the percentage of valid or usable measurements compared to planned measurements. Valid data are defined as all data that are not rejected for project use. All data were considered valid. The completeness goal was met for all analytes.



## REFERENCES

Arcadis. 2017. Final Compliance Monitoring Plan. Former Unocal Edmonds Bulk Fuel Terminal. July 31.

USEPA 2017. National Functional Guidelines for Superfund Organic Methods Data Review (USEPA-540-R-2017-002). January.

## ATTACHMENTS

Table 1: Sample Summary

Table 2: Qualified Results Summary

**Table 1: Sample Summary**

<b>Field Sample ID</b>	<b>Laboratory Sample ID</b>	<b>Sample Date</b>	<b>Sample Time</b>	<b>Sample Purpose</b>
MW-126-W-181130	9920259	11/30/2018	09:00	Regular
MW-143-W-181130	9920260	11/30/2018	10:10	Regular
MW-521-W-181130	9920261	11/30/2018	11:20	Regular
DUP-4-WD-181130	9920262	11/30/2018	NA	Field Duplicate
QA-T-181130	9920263	11/30/2018	NA	Trip Blank

Note:

NA: not applicable

**Table 2: Qualified Results Summary**

Laboratory Sample ID	Field Sample ID	Sample Purpose	SDG	Analytical Method	Parameter	Laboratory Result	Unit	Laboratory Qualifier	Validation Qualifier	Reason Code	Detect Flag
9920259	MW-126-W-181130	REG	2014142	EPA 300.0	Sulfate	35,800	ug/l	--	J	MSH	Y
9920262	DUP-4-WD-181130	FD	2014142	EPA 300.0	Sulfate	43,500	ug/l	--	J	MSH	Y

Notes:

REG: regular

SDG: sample delivery group

EPA: environmental protection agency

J: the concentration is an approximate value

MSH: MS recovery was above the upper control limit

FD: field duplicate exceeded RPD

ug/L: micrograms per liter

Y: analyte detected

# APPENDIX F

## Discharge Monitoring Reports





Permit Number: WA0991007

Permittee: Former Unocal Edmonds Bulk Terminal

Facility County: Snohomish

Receiving Waterbody: Shelleberger Creek

Monitoring Period: 11/01/2017 - 11/30/2017

Outfall: 002 - Willow Creek

Version: 1

Week	Monitoring Point	Flow Gallons/minute (gpm) Once per defined event Metered/Recorded	pH Standard Units Weekly Grab	Benzene Micrograms/L (ug/L) Weekly Grab	NWTPHGx Gasoline (NWTPH Ox) (volatile) Micrograms/L (ug/L) Weekly Grab	NWTPHDx Diesel (NWTPH Dx) (semi-volatile) Micrograms/L (ug/L) Weekly Grab	Polynuclear Aromatic Hydrocarbons (PAH) Carcinogenic PAHs Micrograms/L (ug/L) Weekly Calculated	Benzo(a)anthracene Micrograms/L (ug/L) Weekly Grab	Benzo(b)fluoranthene (3,4-Benzofluoranthene) Micrograms/L (ug/L) Weekly Grab	Benzo(k)fluoranthene (11,12-benzofluoranthene) Micrograms/L (ug/L) Weekly Grab	Chrysene Micrograms/L (ug/L) Weekly Grab	Benzo(a)pyrene Micrograms/L (ug/L) Weekly Grab
		DE1	DE1	DE1	DE1	DE1	DE1	DE1	DE1	DE1	DE1	DE1
1-W	11/1/17											
1-Th	11/2/17											
1-F	11/3/17											
1-Sa	11/4/17											
2-Su	11/5/17											
2-M	11/6/17											
2-T	11/7/17											
2-W	11/8/17											
2-Th	11/9/17											
2-F	11/10/17											
2-Sa	11/11/17											
3-Su	11/12/17											
3-M	11/13/17											
3-T	11/14/17											
3-W	11/15/17											
3-Th	11/16/17											
3-F	11/17/17											
3-Sa	11/18/17											
4-Su	11/19/17											
4-M	11/20/17											
4-T	11/21/17											
4-W	11/22/17											
4-Th	11/23/17											
4-F	11/24/17											
4-Sa	11/25/17											
5-Su	11/26/17											
5-M	11/27/17											
5-T	11/28/17											
5-W	11/29/17											
5-Th	11/30/17											
Daily Minimum			>= 6.0 (RO)									
Daily Maximum		<= 15 (RO)	<= 9.0 (RO)	<= 16 (RO)	<= 800 (RO)	<= 500 (RO)	<= 0.05 (RO)	Report Only	Report Only	Report Only	Report Only	Report Only

Reporting Codes Used: C - No Discharge

Overall DMR Notes/Comment

Reporting Code: C - No Discharge



Week	Monitoring Point	Dibenzofluanthracene Micrograms/L (ug/L) Weekly Grab	Indeno(1,2,3-cd)pyrene Micrograms/L (ug/L) Weekly Grab	Chitosan Acetate Yes/No Weekly Grab	Flow Gallons/minute (gpm) Weekly Metered/Recorded	pH Standard Units Weekly Grab	Benzene Micrograms/L (ug/L) Weekly Grab	NWTPHGx Gasoline (NWTPH Ox) (volatile) Micrograms/L (ug/L) Weekly Grab	NWTPHDx Diesel (NWTPH Dx) (semi-volatile) Micrograms/L (ug/L) Weekly Grab	Polynuclear Aromatic Hydrocarbons (PAH) Carcinogenic PAHs Micrograms/L (ug/L) Weekly Calculated	Benzofluanthracene Micrograms/L (ug/L) Weekly Grab	Benzofluoranthrene (3,4-Benzofluoranthrene) Micrograms/L (ug/L) Weekly Grab
		DE1	DE1	DE1	DPE	DPE	DPE	DPE	DPE	DPE	DPE	DPE
1-W	11/1/17											
1-Th	11/2/17											
1-F	11/3/17											
1-Sa	11/4/17											
2-Su	11/5/17											
2-M	11/6/17											
2-T	11/7/17											
2-W	11/8/17											
2-Th	11/9/17											
2-F	11/10/17											
2-Sa	11/11/17											
3-Su	11/12/17											
3-M	11/13/17											
3-T	11/14/17											
3-W	11/15/17											
3-Th	11/16/17											
3-F	11/17/17											
3-Sa	11/18/17											
4-Su	11/19/17											
4-M	11/20/17											
4-T	11/21/17											
4-W	11/22/17											
4-Th	11/23/17											
4-F	11/24/17											
4-Sa	11/25/17											
5-Su	11/26/17											
5-M	11/27/17											
5-T	11/28/17											
5-W	11/29/17											
5-Th	11/30/17											
Daily Minimum						>= 6.0 (RO)						
Daily Maximum	Report Only	Report Only	<= 0 (RO)	<= 100 (RO)	<= 9.0 (RO)	<= 16 (RO)	<= 800 (RO)	<= 500 (RO)	<= 0.05 (RO)	Report Only	Report Only	







*I certify under penalty of law, that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.*

Garrick Jauregui

12/20/2017 4:53:20 PM

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**Signature**

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**Date**



Permit Number: WA0991007

Permittee: Former Unocal Edmonds Bulk Terminal

Facility County: Snohomish

Receiving Waterbody: Shelleberger Creek

Monitoring Period: 12/01/2017 - 12/31/2017

Outfall: 002 - Willow Creek

Version: 1

Week	Monitoring Point	Flow	pH	Benzene	NWTPHGx	NWTPHDx	Polynuclear Aromatic Hydrocarbons (PAH)	Benz(a)anthracene	Benz(b)fluoranthene	Benz(k)fluoranthene	Chrysene	Benz(a)pyrene
		Gallons/minute (gpm) Once per defined event Metered/Recorded	Standard Units Weekly Grab	Micrograms/L (ug/L) Weekly Grab	Gasoline (NWTPH Gx) (volatile) Micrograms/L (ug/L) Weekly Grab	Diesel (NWTPH Dx) (semi-volatile) Micrograms/L (ug/L) Weekly Grab	Carcinogenic PAHs Micrograms/L (ug/L) Weekly Calculated	Micrograms/L (ug/L) Weekly Grab	Micrograms/L (ug/L) Weekly Grab	Micrograms/L (ug/L) Weekly Grab	Micrograms/L (ug/L) Weekly Grab	Micrograms/L (ug/L) Weekly Grab
		DE1	DE1	DE1	DE1	DE1	DE1	DE1	DE1	DE1	DE1	DE1
1-F	12/1/17											
1-Sa	12/2/17											
2-Su	12/3/17											
2-M	12/4/17											
2-T	12/5/17											
2-W	12/6/17											
2-Th	12/7/17											
2-F	12/8/17											
2-Sa	12/9/17											
3-Su	12/10/17											
3-M	12/11/17											
3-T	12/12/17											
3-W	12/13/17											
3-Th	12/14/17											
3-F	12/15/17											
3-Sa	12/16/17											
4-Su	12/17/17											
4-M	12/18/17											
4-T	12/19/17											
4-W	12/20/17											
4-Th	12/21/17											
4-F	12/22/17											
4-Sa	12/23/17											
5-Su	12/24/17											
5-M	12/25/17											
5-T	12/26/17											
5-W	12/27/17											
5-Th	12/28/17											
5-F	12/29/17											
5-Sa	12/30/17											
6-Su	12/31/17											
Daily Minimum			>= 6.0 (RO)									
Daily Maximum		<= 15 (RO)	<= 9.0 (RO)	<= 16 (RO)	<= 800 (RO)	<= 500 (RO)	<= 0.05 (RO)	Report Only	Report Only	Report Only	Report Only	Report Only

Reporting Codes Used: B - Below Detection Limit/No Detection, C - No Discharge, J - Estimated Value/Below Quantitation Limit

Overall DMR Notes/Comment

This permit is for the DPE system only. The excavation at this site is complete therefore there is no DB-2 temporary water treatment system.



Week	Monitoring Point	Parameters										
		DE1	DE1	DE1	DPE	DPE	DPE	DPE	DPE	DPE	DPE	DPE
		Dibenzofuranthracene Micrograms/L (ug/L) Weekly Grab	Indeno(1,2,3-cd)pyrene Micrograms/L (ug/L) Weekly Grab	Chitosan Acetate Yes/No Weekly Grab	Flow Gallons/minute (gpm) Weekly Metered/Recorded	pH Standard Units Weekly Grab	Benzene Micrograms/L (ug/L) Weekly Grab	NWTPHGx Gasoline (NWTPH Ox) (volatile) Micrograms/L (ug/L) Weekly Grab	NWTPHDx Diesel (NWTPH Dx) (semi-volatile) Micrograms/L (ug/L) Weekly Grab	Polynuclear Aromatic Hydrocarbons (PAH) Carcinogenic PAHs Micrograms/L (ug/L) Weekly Calculated	Benzofuranthracene Micrograms/L (ug/L) Weekly Grab	Benzofluoranthene (3,4-Benzofluoranthene) Micrograms/L (ug/L) Weekly Grab
1-F	12/1/17				47.4	7.8	B 1	B 250	B 24	B 0.0034	J 0.0067	B 0.0081
1-Sa	12/2/17											
2-Su	12/3/17											
2-M	12/4/17											
2-T	12/5/17				47.4	7.8	B 1	B 250	J 24	0.012	J 0.009	J 0.0098
2-W	12/6/17											
2-Th	12/7/17											
2-F	12/8/17											
2-Sa	12/9/17											
3-Su	12/10/17											
3-M	12/11/17											
3-T	12/12/17											
3-W	12/13/17											
3-Th	12/14/17				48.5	8.02	B 1	B 250	J 28	0.008	J 0.0039	B 0.0083
3-F	12/15/17											
3-Sa	12/16/17											
4-Su	12/17/17											
4-M	12/18/17											
4-T	12/19/17											
4-W	12/20/17				50.3	7.3	B 1	B 250	J 81	0.003	J 0.0038	B 0.0084
4-Th	12/21/17											
4-F	12/22/17											
4-Sa	12/23/17											
5-Su	12/24/17											
5-M	12/25/17											
5-T	12/26/17											
5-W	12/27/17											
5-Th	12/28/17				47.1	7.4	B 1	B 250	J 77	B 0.031	B 0.022	B 0.089
5-F	12/29/17											
5-Sa	12/30/17											
6-Su	12/31/17											
Daily Minimum						7.3						
						>= 6.0 (RO)						
Daily Maximum					50.3	8.02	1	250	81	0.031	0.022	0.089
		Report Only	Report Only	<= 0 (RO)	<= 100 (RO)	<= 9.0 (RO)	<= 16 (RO)	<= 800 (RO)	<= 500 (RO)	<= 0.05 (RO)	Report Only	Report Only





**Outfall: 002 - Willow Creek**

Monitoring Point	Parameter	Sample Date/ Statistical Base	Value	Notes/Comment
DE1	All Parameters		C	

*I certify under penalty of law, that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.*

Garrick Jauregui

**Signature**

1/23/2018 5:27:44 PM

**Date**



Permit Number: WA0991007

Permittee: Former Unocal Edmonds Bulk Terminal

Facility County: Snohomish

Receiving Waterbody: Shelleberger Creek

Monitoring Period: 01/01/2018 - 01/31/2018

Outfall: 002 - Willow Creek

Version: 3

Week	Monitoring Point	Flow Gallons/minute (gpm) Weekly Metered/Recorded	pH Standard Units Weekly Grab	Benzene Micrograms/L (ug/L) Weekly Grab	NWTPHGx Gasoline (NWTPH Ox) (volatile) Micrograms/L (ug/L) Weekly Grab	NWTPHDx Diesel (NWTPH Dx) (semi-volatile) Micrograms/L (ug/L) Weekly Grab	Polynuclear Aromatic Hydrocarbons (PAH) Carcinogenic PAHs Micrograms/L (ug/L) Weekly Calculated	Benz(a)anthracene Micrograms/L (ug/L) Weekly Grab	Benz(b)fluoranthene (3,4-Benzofluoranthene) Micrograms/L (ug/L) Weekly Grab	Benz(k)fluoranthene (11,12-benzofluoranthene) Micrograms/L (ug/L) Weekly Grab	Chrysene Micrograms/L (ug/L) Weekly Grab	Benz(a)pyrene Micrograms/L (ug/L) Weekly Grab
		DPE	DPE	DPE	DPE	DPE	DPE	DPE	DPE	DPE	DPE	DPE
1-M	1/1/18											
1-T	1/2/18											
1-W	1/3/18											
1-Th	1/4/18											
1-F	1/5/18	49.3	6.87	<1	<250	<100	<0.003	<0.0021	<0.0085	<0.0096	<0.0064	<0.0032
1-Sa	1/6/18											
2-Su	1/7/18											
2-M	1/8/18											
2-T	1/9/18	50.2	7.08	<1	<250	J 46	<0.003	<0.002	<0.0082	<0.0092	<0.0061	<0.0031
2-W	1/10/18											
2-Th	1/11/18											
2-F	1/12/18											
2-Sa	1/13/18											
3-Su	1/14/18											
3-M	1/15/18											
3-T	1/16/18											
3-W	1/17/18											
3-Th	1/18/18	47.0	8.08	<2	<250	J 58	0.009	J 0.0078	<0.0084	<0.0094	J 0.0065	J 0.0063
3-F	1/19/18											
3-Sa	1/20/18											
4-Su	1/21/18											
4-M	1/22/18											
4-T	1/23/18											
4-W	1/24/18	70.8	7.58	<2	<250	<110	0.010	J 0.0079	<0.0082	<0.0092	J 0.0073	J 0.0070
4-Th	1/25/18											
4-F	1/26/18											
4-Sa	1/27/18											
5-Su	1/28/18											
5-M	1/29/18											
5-T	1/30/18											
5-W	1/31/18											
Daily Minimum			6.87									
			>= 6.0 (RO)									
Daily Maximum		70.8	8.08	<2	<250	<110	0.01	0.0079	<0.0085	<0.0096	0.0073	0.007
		<= 100 (RO)	<= 9.0 (RO)	<= 16 (RO)	<= 800 (RO)	<= 500 (RO)	<= 0.05 (RO)	Report Only	Report Only	Report Only	Report Only	Report Only

Reporting Codes Used: B - Below Detection Limit/No Detection, J - Estimated Value/Below Quantitation Limit



Week	Monitoring Point	Dibenzofuran/fluorene Micrograms/L (ug/L) Weekly Grab	Indeno(1,2,3-cd)pyrene Micrograms/L (ug/L) Weekly Grab
		DPE	DPE
1-M	1/1/18		
1-T	1/2/18		
1-W	1/3/18		
1-Th	1/4/18		
1-F	1/5/18	<0.0021	<0.0075
1-Sa	1/6/18		
2-Su	1/7/18		
2-M	1/8/18		
2-T	1/9/18	<0.002	<0.0071
2-W	1/10/18		
2-Th	1/11/18		
2-F	1/12/18		
2-Sa	1/13/18		
3-Su	1/14/18		
3-M	1/15/18		
3-T	1/16/18		
3-W	1/17/18		
3-Th	1/18/18	J 0.0053	J 0.0075
3-F	1/19/18		
3-Sa	1/20/18		
4-Su	1/21/18		
4-M	1/22/18		
4-T	1/23/18		
4-W	1/24/18	J 0.0060	J 0.0075
4-Th	1/25/18		
4-F	1/26/18		
4-Sa	1/27/18		
5-Su	1/28/18		
5-M	1/29/18		
5-T	1/30/18		
5-W	1/31/18		
<b>Daily Minimum</b>			
<b>Daily Maximum</b>		0.006	0.0075
		Report Only	Report Only



*I certify under penalty of law, that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.*

Garrick Jauregui

**Signature**

4/4/2019 12:59:56 PM

**Date**





Permit Number: WA0991007

Permittee: Former Unocal Edmonds Bulk Terminal

Facility County: Snohomish

Receiving Waterbody: Shelleberger Creek

Monitoring Period: 02/01/2018 - 02/28/2018

Outfall: 002 - Willow Creek

Version: 1

Week	Monitoring Point	Flow Gallons/minute (gpm) Weekly Metered/Recorded	pH Standard Units Weekly Grab	Benzene Micrograms/L (ug/L) Weekly Grab	NWTPHGx Gasoline (NWTPH Ox) (volatile) Micrograms/L (ug/L) Weekly Grab	NWTPHDx Diesel (NWTPH Dx) (semi-volatile) Micrograms/L (ug/L) Weekly Grab	Polynuclear Aromatic Hydrocarbons (PAH) Carcinogenic PAHs Micrograms/L (ug/L) Weekly Calculated	Benzofluoranthene Micrograms/L (ug/L) Weekly Grab	Benzofluoranthene (3,4-Benzofluoranthene) Micrograms/L (ug/L) Weekly Grab	Benzofluoranthene (1,1,12-benzofluoranthene) Micrograms/L (ug/L) Weekly Grab	Chrysene Micrograms/L (ug/L) Weekly Grab	Benzofluoranthene Micrograms/L (ug/L) Weekly Grab
		DPE	DPE	DPE	DPE	DPE	DPE	DPE	DPE	DPE	DPE	DPE
1-Th	2/1/18	50	7.58	B 2	B 250	B 110	B 0.003	B 0.002	B 0.0082	B 0.0092	B 0.0061	B 0.003
1-F	2/2/18											
1-Sa	2/3/18											
2-Su	2/4/18											
2-M	2/5/18											
2-T	2/6/18	59.1	7.70	B 1	B 250	B 110	0.007	J 0.0053	B 0.0081	B 0.0091	B 0.0061	J 0.0048
2-W	2/7/18											
2-Th	2/8/18											
2-F	2/9/18											
2-Sa	2/10/18											
3-Su	2/11/18											
3-M	2/12/18											
3-T	2/13/18	52.2	7.78	B 1	B 250	B 110	0.003	J 0.0043	B 0.0081	B 0.0091	B 0.0061	B 0.003
3-W	2/14/18											
3-Th	2/15/18											
3-F	2/16/18											
3-Sa	2/17/18											
4-Su	2/18/18											
4-M	2/19/18											
4-T	2/20/18	C	C	C	C	C	C	C	C	C	C	C
4-W	2/21/18											
4-Th	2/22/18											
4-F	2/23/18											
4-Sa	2/24/18											
5-Su	2/25/18											
5-M	2/26/18											
5-T	2/27/18	35.7	7.85	1	250	110	B 0.003	B 0.0021	B 0.0083	B 0.0093	B 0.0062	B 0.0031
5-W	2/28/18											
Daily Minimum			7.58									
			>= 6.0 (RO)									
Daily Maximum		59.1	7.85	2	250	110	0.007	0.0053	0.0083	0.0093	0.0062	0.0048
		<= 100 (RO)	<= 9.0 (RO)	<= 16 (RO)	<= 800 (RO)	<= 500 (RO)	<= 0.05 (RO)	Report Only	Report Only	Report Only	Report Only	Report Only

Reporting Codes Used: B - Below Detection Limit/No Detection, C - No Discharge, J - Estimated Value/Below Quantitation Limit

I certify under penalty of law, that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Garrick Jauregui  
Signature

3/28/2018 12:19:24 PM  
Date



Week	Monitoring Point	Dibenzofuran/fluorene Micrograms/L (ug/L) Weekly Grab	Indeno(1,2,3-cd)pyrene Micrograms/L (ug/L) Weekly Grab
		DPE	DPE
1-Th	2/1/18	B 0.002	B 0.0071
1-F	2/2/18		
1-Sa	2/3/18		
2-Su	2/4/18		
2-M	2/5/18		
2-T	2/6/18	J 0.0026	B 0.0071
2-W	2/7/18		
2-Th	2/8/18		
2-F	2/9/18		
2-Sa	2/10/18		
3-Su	2/11/18		
3-M	2/12/18		
3-T	2/13/18	B 0.002	B 0.0071
3-W	2/14/18		
3-Th	2/15/18		
3-F	2/16/18		
3-Sa	2/17/18		
4-Su	2/18/18		
4-M	2/19/18		
4-T	2/20/18	C	C
4-W	2/21/18		
4-Th	2/22/18		
4-F	2/23/18		
4-Sa	2/24/18		
5-Su	2/25/18		
5-M	2/26/18		
5-T	2/27/18	B 0.0021	B 0.0072
5-W	2/28/18		
Daily Minimum			
Daily Maximum		0.0026 Report Only	0.0072 Report Only



Permit Number: WA0991007

Permittee: Former Unocal Edmonds Bulk Terminal

Facility County: Snohomish

Receiving Waterbody: Shelleberger Creek

Monitoring Period: 03/01/2018 - 03/31/2018

Outfall: 002 - Willow Creek

Version: 1

Week	Monitoring Point	Flow Gallons/minute (gpm) Weekly Metered/Recorded	pH Standard Units Weekly Grab	Benzene Micrograms/L (ug/L) Weekly Grab	NWTPHGx Gasoline (NWTPH Ox) (volatile) Micrograms/L (ug/L) Weekly Grab	NWTPHDx Diesel (NWTPH Dx) (semi-volatile) Micrograms/L (ug/L) Weekly Grab	Polynuclear Aromatic Hydrocarbons (PAH) Carcinogenic PAHs Micrograms/L (ug/L) Weekly Calculated	Benz(a)anthracene Micrograms/L (ug/L) Weekly Grab	Benz(b)fluoranthene (3,4-Benzofluoranthene) Micrograms/L (ug/L) Weekly Grab	Benz(k)fluoranthene (11,12-benzofluoranthene) Micrograms/L (ug/L) Weekly Grab	Chrysene Micrograms/L (ug/L) Weekly Grab	Benz(a)pyrene Micrograms/L (ug/L) Weekly Grab
		DPE	DPE	DPE	DPE	DPE	DPE	DPE	DPE	DPE	DPE	DPE
1-Th	3/1/18											
1-F	3/2/18											
1-Sa	3/3/18											
2-Su	3/4/18											
2-M	3/5/18	40.30	7.75	B 1	B 250	B 110	0.00356	J 0.0044	B 0.0085	B 0.0096	B 0.0064	B 0.0032
2-T	3/6/18											
2-W	3/7/18											
2-Th	3/8/18											
2-F	3/9/18											
2-Sa	3/10/18											
3-Su	3/11/18											
3-M	3/12/18											
3-T	3/13/18											
3-W	3/14/18	32.20	7.70	B 1	B 250	B 110	B 0.0030	B 0.002	B 0.0082	B 0.0092	B 0.0061	B 0.0031
3-Th	3/15/18											
3-F	3/16/18											
3-Sa	3/17/18											
4-Su	3/18/18	C	C	C	C	C	C	C	C	C	C	C
4-M	3/19/18											
4-T	3/20/18											
4-W	3/21/18											
4-Th	3/22/18											
4-F	3/23/18											
4-Sa	3/24/18											
5-Su	3/25/18	C	C	C	C	C	C	C	C	C	C	C
5-M	3/26/18											
5-T	3/27/18											
5-W	3/28/18											
5-Th	3/29/18											
5-F	3/30/18											
5-Sa	3/31/18											
Daily Minimum			7.70									
			>= 6.0 (RO)									
Daily Maximum		40.3	7.75	1	250	110	0.00356	0.0044	0.0085	0.0096	0.0064	0.0032
		<= 100 (RO)	<= 9.0 (RO)	<= 16 (RO)	<= 800 (RO)	<= 500 (RO)	<= 0.05 (RO)	Report Only	Report Only	Report Only	Report Only	Report Only

Reporting Codes Used: B - Below Detection Limit/No Detection, C - No Discharge, J - Estimated Value/Below Quantitation Limit

## Overall DMR Notes/Comment

The system shutdown on 3/14/18 at 21:14 and remained offline for the duration of the month.



Week	Monitoring Point	Dibenzofuran/fluorene Micrograms/L (ug/L) Weekly Grab	Indeno(1,2,3-cd)pyrene Micrograms/L (ug/L) Weekly Grab
		DPE	DPE
1-Th	3/1/18		
1-F	3/2/18		
1-Sa	3/3/18		
2-Su	3/4/18		
2-M	3/5/18	0.0021	B 0.0074
2-T	3/6/18		
2-W	3/7/18		
2-Th	3/8/18		
2-F	3/9/18		
2-Sa	3/10/18		
3-Su	3/11/18		
3-M	3/12/18		
3-T	3/13/18		
3-W	3/14/18	B 0.002	B 0.0072
3-Th	3/15/18		
3-F	3/16/18		
3-Sa	3/17/18		
4-Su	3/18/18	C	C
4-M	3/19/18		
4-T	3/20/18		
4-W	3/21/18		
4-Th	3/22/18		
4-F	3/23/18		
4-Sa	3/24/18		
5-Su	3/25/18	C	C
5-M	3/26/18		
5-T	3/27/18		
5-W	3/28/18		
5-Th	3/29/18		
5-F	3/30/18		
5-Sa	3/31/18		
<b>Daily Minimum</b>			
<b>Daily Maximum</b>		0.0021	0.0074
		Report Only	Report Only



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Garrick Jauregui

4/24/2018 9:48:39 AM

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**Signature**

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**Date**



Permit Number: WA0991007

Permittee: Former Unocal Edmonds Bulk Terminal

Facility County: Snohomish

Receiving Waterbody: Shelleberger Creek

Monitoring Period: 04/01/2018 - 04/30/2018

Outfall: 002 - Willow Creek

Version: 1

Week	Monitoring Point	Flow Gallons/minute (gpm) Weekly Metered/Recorded	pH Standard Units Weekly Grab	Benzene Micrograms/L (ug/L) Weekly Grab	NWTPHGx Gasoline (NWTPH Gx) (volatile) Micrograms/L (ug/L) Weekly Grab	NWTPHDx Diesel (NWTPH Dx) (semi-volatile) Micrograms/L (ug/L) Weekly Grab	Polynuclear Aromatic Hydrocarbons (PAH) Carcinogenic PAHs Micrograms/L (ug/L) Weekly Calculated	Benz(a)anthracene Micrograms/L (ug/L) Weekly Grab	Benz(b)fluoranthene (3,4-Benzofluoranthene) Micrograms/L (ug/L) Weekly Grab	Benz(k)fluoranthene (11,12-benzofluoranthene) Micrograms/L (ug/L) Weekly Grab	Chrysene Micrograms/L (ug/L) Weekly Grab	Benz(a)pyrene Micrograms/L (ug/L) Weekly Grab
		DPE	DPE	DPE	DPE	DPE	DPE	DPE	DPE	DPE	DPE	DPE
1-Su	4/1/18											
1-M	4/2/18											
1-T	4/3/18											
1-W	4/4/18											
1-Th	4/5/18											
1-F	4/6/18											
1-Sa	4/7/18											
2-Su	4/8/18											
2-M	4/9/18											
2-T	4/10/18											
2-W	4/11/18											
2-Th	4/12/18											
2-F	4/13/18											
2-Sa	4/14/18											
3-Su	4/15/18											
3-M	4/16/18											
3-T	4/17/18											
3-W	4/18/18											
3-Th	4/19/18											
3-F	4/20/18											
3-Sa	4/21/18											
4-Su	4/22/18											
4-M	4/23/18											
4-T	4/24/18											
4-W	4/25/18											
4-Th	4/26/18											
4-F	4/27/18											
4-Sa	4/28/18											
5-Su	4/29/18											
5-M	4/30/18											
Daily Minimum			>= 6.0 (RO)									
Daily Maximum		<= 100 (RO)	<= 9.0 (RO)	<= 16 (RO)	<= 800 (RO)	<= 500 (RO)	<= 0.05 (RO)	Report Only	Report Only	Report Only	Report Only	Report Only

Reporting Codes Used: C - No Discharge

Overall DMR Notes/Comment

Reporting Code: C - No Discharge

No Discharge during April 2018 due to system maintenance.



Week	Monitoring Point	Dibenzofuran/fluorene Micrograms/L (ug/L) Weekly Grab	Indeno(1,2,3-cd)pyrene Micrograms/L (ug/L) Weekly Grab
		DPE	DPE
1-Su	4/1/18		
1-M	4/2/18		
1-T	4/3/18		
1-W	4/4/18		
1-Th	4/5/18		
1-F	4/6/18		
1-Sa	4/7/18		
2-Su	4/8/18		
2-M	4/9/18		
2-T	4/10/18		
2-W	4/11/18		
2-Th	4/12/18		
2-F	4/13/18		
2-Sa	4/14/18		
3-Su	4/15/18		
3-M	4/16/18		
3-T	4/17/18		
3-W	4/18/18		
3-Th	4/19/18		
3-F	4/20/18		
3-Sa	4/21/18		
4-Su	4/22/18		
4-M	4/23/18		
4-T	4/24/18		
4-W	4/25/18		
4-Th	4/26/18		
4-F	4/27/18		
4-Sa	4/28/18		
5-Su	4/29/18		
5-M	4/30/18		
Daily Minimum			
Daily Maximum		Report Only	Report Only



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Garrick Jauregui

5/4/2018 2:54:54 PM

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**Signature**

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**Date**





Permit Number: WA0991007

Permittee: Former Unocal Edmonds Bulk Terminal

Facility County: Snohomish

Receiving Waterbody: Shelleberger Creek

Monitoring Period: 05/01/2018 - 05/31/2018

Outfall: 002 - Willow Creek

Version: 1

Week	Monitoring Point	Flow Gallons/minute (gpm) Weekly Metered/Recorded	pH Standard Units Weekly Grab	Benzene Micrograms/L (ug/L) Weekly Grab	NWTPHGx Gasoline (NWTPH Ox) (volatile) Micrograms/L (ug/L) Weekly Grab	NWTPHDx Diesel (NWTPH Dx) (semi-volatile) Micrograms/L (ug/L) Weekly Grab	Polynuclear Aromatic Hydrocarbons (PAH) Carcinogenic PAHs Micrograms/L (ug/L) Weekly Calculated	Benz(a)anthracene Micrograms/L (ug/L) Weekly Grab	Benz(b)fluoranthene (3,4-Benzofluoranthene) Micrograms/L (ug/L) Weekly Grab	Benz(k)fluoranthene (11,12-benzofluoranthene) Micrograms/L (ug/L) Weekly Grab	Chrysene Micrograms/L (ug/L) Weekly Grab	Benz(a)pyrene Micrograms/L (ug/L) Weekly Grab
Week	Monitoring Point	DPE	DPE	DPE	DPE	DPE	DPE	DPE	DPE	DPE	DPE	DPE
1-T	5/1/18											
1-W	5/2/18											
1-Th	5/3/18											
1-F	5/4/18											
1-Sa	5/5/18	C	C	C	C	C	C	C	C	C	C	C
2-Su	5/6/18											
2-M	5/7/18											
2-T	5/8/18											
2-W	5/9/18	62.10	7.13	B 1	B 250	B 110	B 0.003	B 0.002	B 0.0081	B 0.0091	B 0.0061	B 0.003
2-Th	5/10/18											
2-F	5/11/18											
2-Sa	5/12/18											
3-Su	5/13/18											
3-M	5/14/18											
3-T	5/15/18											
3-W	5/16/18											
3-Th	5/17/18	52.40	8.04	B 1	B 250	B 110	0.003	J 0.0045	B 0.0081	B 0.0091	B 0.0061	B 0.003
3-F	5/18/18											
3-Sa	5/19/18											
4-Su	5/20/18											
4-M	5/21/18											
4-T	5/22/18											
4-W	5/23/18	50.40	7.98	B 1	B 250	B 110	B 0.003	B 0.0022	B 0.0087	B 0.0097	B 0.0065	B 0.0032
4-Th	5/24/18											
4-F	5/25/18											
4-Sa	5/26/18											
5-Su	5/27/18											
5-M	5/28/18											
5-T	5/29/18	58.50	7.81	B 1	B 250	B 120	0.004	0.0049	B 0.0087	B 0.0097	B 0.0065	B 0.0032
5-W	5/30/18											
5-Th	5/31/18											
Daily Minimum			7.13									
			>= 6.0 (RO)									
Daily Maximum		62.1	8.04	1	250	120	0.004	0.0049	0.0087	0.0097	0.0065	0.0032
		<= 100 (RO)	<= 9.0 (RO)	<= 16 (RO)	<= 800 (RO)	<= 500 (RO)	<= 0.05 (RO)	Report Only	Report Only	Report Only	Report Only	Report Only

Reporting Codes Used: B - Below Detection Limit/No Detection, C - No Discharge, J - Estimated Value/Below Quantitation Limit



Week	Monitoring Point	Dibenzofuran/fluorene Micrograms/L (ug/L) Weekly Grab	Indeno(1,2,3-cd)pyrene Micrograms/L (ug/L) Weekly Grab
		DPE	DPE
1-T	5/1/18		
1-W	5/2/18		
1-Th	5/3/18		
1-F	5/4/18		
1-Sa	5/5/18	C	C
2-Su	5/6/18		
2-M	5/7/18		
2-T	5/8/18		
2-W	5/9/18	B 0.002	B 0.0071
2-Th	5/10/18		
2-F	5/11/18		
2-Sa	5/12/18		
3-Su	5/13/18		
3-M	5/14/18		
3-T	5/15/18		
3-W	5/16/18		
3-Th	5/17/18	B 0.002	B 0.0071
3-F	5/18/18		
3-Sa	5/19/18		
4-Su	5/20/18		
4-M	5/21/18		
4-T	5/22/18		
4-W	5/23/18	B 0.0022	B 0.0076
4-Th	5/24/18		
4-F	5/25/18		
4-Sa	5/26/18		
5-Su	5/27/18		
5-M	5/28/18		
5-T	5/29/18	0.0061	B 0.0076
5-W	5/30/18		
5-Th	5/31/18		
<b>Daily Minimum</b>			
<b>Daily Maximum</b>		0.0061	0.0076
		Report Only	Report Only



*I certify under penalty of law, that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.*

Garrick Jauregui

6/15/2018 9:41:02 AM

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**Signature**

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**Date**



Permit Number: WA0991007

Permittee: Former Unocal Edmonds Bulk Terminal

Facility County: Snohomish

Receiving Waterbody: Shelleberger Creek

Monitoring Period: 06/01/2018 - 06/30/2018

Outfall: 002 - Willow Creek

Version: 1

Week	Monitoring Point	Flow Gallons/minute (gpm) Weekly Metered/Recorded	pH Standard Units Weekly Grab	Benzene Micrograms/L (ug/L) Weekly Grab	NWTPHGx Gasoline (NWTPH Ox) (volatile) Micrograms/L (ug/L) Weekly Grab	NWTPHDx Diesel (NWTPH Dx) (semi-volatile) Micrograms/L (ug/L) Weekly Grab	Polynuclear Aromatic Hydrocarbons (PAH) Carcinogenic PAHs Micrograms/L (ug/L) Weekly Calculated	Benzo(a)anthracene Micrograms/L (ug/L) Weekly Grab	Benzo(b)fluoranthene (3,4-Benzofluoranthene) Micrograms/L (ug/L) Weekly Grab	Benzo(k)fluoranthene (11,12-benzofluoranthene) Micrograms/L (ug/L) Weekly Grab	Chrysene Micrograms/L (ug/L) Weekly Grab	Benzo(a)pyrene Micrograms/L (ug/L) Weekly Grab
Week	Monitoring Point	DPE	DPE	DPE	DPE	DPE	DPE	DPE	DPE	DPE	DPE	DPE
1-F	6/1/18											
1-Sa	6/2/18											
2-Su	6/3/18											
2-M	6/4/18											
2-T	6/5/18	81.2	8.15	2.9	B 250	B 120	0.003	B 0.0023	B 0.009	B 0.01	B 0.0068	B 0.0034
2-W	6/6/18											
2-Th	6/7/18											
2-F	6/8/18											
2-Sa	6/9/18											
3-Su	6/10/18											
3-M	6/11/18											
3-T	6/12/18											
3-W	6/13/18											
3-Th	6/14/18											
3-F	6/15/18	77.7	8.19	B 1	B 250	B 120	B 0.009	B 0.015	B 0.012	B 0.013	B 0.017	B 0.012
3-Sa	6/16/18											
4-Su	6/17/18											
4-M	6/18/18	68.2	8.23	B 1	B 250	B 110	B 0.009	B 0.014	B 0.011	B 0.012	B 0.016	B 0.011
4-T	6/19/18											
4-W	6/20/18											
4-Th	6/21/18											
4-F	6/22/18											
4-Sa	6/23/18											
5-Su	6/24/18											
5-M	6/25/18											
5-T	6/26/18											
5-W	6/27/18											
5-Th	6/28/18											
5-F	6/29/18	73.4	6.78	B 1	J 100	B 140	B 0.009	B 0.015	B 0.012	B 0.013	B 0.017	B 0.012
5-Sa	6/30/18											
Daily Minimum			6.78 >= 6.0 (RO)									
Daily Maximum		81.2 =<= 100 (RO)	8.23 =<= 9.0 (RO)	2.9 =<= 16 (RO)	250 =<= 800 (RO)	140 =<= 500 (RO)	0.009 =<= 0.05 (RO)	0.015 Report Only	0.012 Report Only	0.013 Report Only	0.017 Report Only	0.012 Report Only

Reporting Codes Used: B - Below Detection Limit/No Detection, J - Estimated Value/Below Quantitation Limit



Week	Monitoring Point	Dibenzofuran/fluorene Micrograms/L (ug/L) Weekly Grab	Indeno(1,2,3-cd)pyrene Micrograms/L (ug/L) Weekly Grab
		DPE	DPE
1-F	6/1/18		
1-Sa	6/2/18		
2-Su	6/3/18		
2-M	6/4/18		
2-T	6/5/18	B 0.0023	B 0.0079
2-W	6/6/18		
2-Th	6/7/18		
2-F	6/8/18		
2-Sa	6/9/18		
3-Su	6/10/18		
3-M	6/11/18		
3-T	6/12/18		
3-W	6/13/18		
3-Th	6/14/18		
3-F	6/15/18	B 0.01	B 0.015
3-Sa	6/16/18		
4-Su	6/17/18		
4-M	6/18/18	B 0.01	B 0.014
4-T	6/19/18		
4-W	6/20/18		
4-Th	6/21/18		
4-F	6/22/18		
4-Sa	6/23/18		
5-Su	6/24/18		
5-M	6/25/18		
5-T	6/26/18		
5-W	6/27/18		
5-Th	6/28/18		
5-F	6/29/18	B 0.011	B 0.015
5-Sa	6/30/18		
Daily Minimum			
Daily Maximum		0.011	0.015
		Report Only	Report Only



*I certify under penalty of law, that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.*

Garrick Jauregui

**Signature**

7/24/2018 11:13:32 AM

**Date**



Permit Number: WA0991007

Permittee: Former Unocal Edmonds Bulk Terminal

Facility County: Snohomish

Receiving Waterbody: Shelleberger Creek

Monitoring Period: 07/01/2018 - 07/31/2018

Outfall: 002 - Willow Creek

Version: 1

Week	Monitoring Point	Flow Gallons/minute (gpm) Weekly Metered/Recorded	pH Standard Units Weekly Grab	Benzene Micrograms/L (ug/L) Weekly Grab	NWTPHGx Gasoline (NWTPH Gx) (volatile) Micrograms/L (ug/L) Weekly Grab	NWTPHDx Diesel (NWTPH Dx) (semi-volatile) Micrograms/L (ug/L) Weekly Grab	Polynuclear Aromatic Hydrocarbons (PAH) Carcinogenic PAHs Micrograms/L (ug/L) Weekly Calculated	Benzo(a)anthracene Micrograms/L (ug/L) Weekly Grab	Benzo(b)fluoranthene (3,4-Benzofluoranthene) Micrograms/L (ug/L) Weekly Grab	Benzo(k)fluoranthene (11,12-benzofluoranthene) Micrograms/L (ug/L) Weekly Grab	Chrysene Micrograms/L (ug/L) Weekly Grab	Benzo(a)pyrene Micrograms/L (ug/L) Weekly Grab
		DPE	DPE	DPE	DPE	DPE	DPE	DPE	DPE	DPE	DPE	DPE
1-Su	7/1/18											
1-M	7/2/18											
1-T	7/3/18											
1-W	7/4/18											
1-Th	7/5/18	70.30	8.17	B 1	B 250	B 110	B 0.009	B 0.014	B 0.011	B 0.012	B 0.016	B 0.011
1-F	7/6/18											
1-Sa	7/7/18											
2-Su	7/8/18											
2-M	7/9/18											
2-T	7/10/18											
2-W	7/11/18	73.10	7.46	B 1	B 250	B 120	B 0.049	B 0.078	B 0.062	B 0.067	B 0.09	B 0.062
2-Th	7/12/18											
2-F	7/13/18											
2-Sa	7/14/18											
3-Su	7/15/18											
3-M	7/16/18											
3-T	7/17/18											
3-W	7/18/18											
3-Th	7/19/18	C	C	C	C	C	C	C	C	C	C	C
3-F	7/20/18											
3-Sa	7/21/18											
4-Su	7/22/18											
4-M	7/23/18											
4-T	7/24/18											
4-W	7/25/18											
4-Th	7/26/18	70.50	8.15	B 1	B 250	B 120	B 0.046	B 0.074	B 0.058	B 0.063	B 0.084	B 0.058
4-F	7/27/18											
4-Sa	7/28/18											
5-Su	7/29/18											
5-M	7/30/18											
5-T	7/31/18											
Daily Minimum			7.46									
			>= 6.0 (RO)									
Daily Maximum		73.1	8.17	1	250	120	0.049	0.078	0.062	0.067	0.09	0.062
		<= 100 (RO)	<= 9.0 (RO)	<= 16 (RO)	<= 800 (RO)	<= 500 (RO)	<= 0.05 (RO)	Report Only	Report Only	Report Only	Report Only	Report Only

Reporting Codes Used: B - Below Detection Limit/No Detection, C - No Discharge



Week	Monitoring Point	Dibenzofuran/fluorene Micrograms/L (ug/L) Weekly Grab	Indeno(1,2,3-cd)pyrene Micrograms/L (ug/L) Weekly Grab
		DPE	DPE
1-Su	7/1/18		
1-M	7/2/18		
1-T	7/3/18		
1-W	7/4/18		
1-Th	7/5/18	B 0.01	B 0.014
1-F	7/6/18		
1-Sa	7/7/18		
2-Su	7/8/18		
2-M	7/9/18		
2-T	7/10/18		
2-W	7/11/18	B 0.056	B 0.078
2-Th	7/12/18		
2-F	7/13/18		
2-Sa	7/14/18		
3-Su	7/15/18		
3-M	7/16/18		
3-T	7/17/18		
3-W	7/18/18		
3-Th	7/19/18	C	C
3-F	7/20/18		
3-Sa	7/21/18		
4-Su	7/22/18		
4-M	7/23/18		
4-T	7/24/18		
4-W	7/25/18		
4-Th	7/26/18	B 0.053	B 0.074
4-F	7/27/18		
4-Sa	7/28/18		
5-Su	7/29/18		
5-M	7/30/18		
5-T	7/31/18		
<b>Daily Minimum</b>			
<b>Daily Maximum</b>		0.056	0.078
		Report Only	Report Only





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Garrick Jauregui

9/25/2018 3:04:59 PM

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Signature

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Date



Permit Number: WA0991007

Permittee: Former Unocal Edmonds Bulk Terminal

Facility County: Snohomish

Receiving Waterbody: Shelleberger Creek

Monitoring Period: 08/01/2018 - 08/31/2018

Outfall: 002 - Willow Creek

Version: 1

Week	Monitoring Point	Flow Gallons/minute (gpm) Weekly Metered/Recorded	pH Standard Units Weekly Grab	Benzene Micrograms/L (ug/L) Weekly Grab	NWTPHGx Gasoline (NWTPH Ox) (volatile) Micrograms/L (ug/L) Weekly Grab	NWTPHDx Diesel (NWTPH Dx) (semi-volatile) Micrograms/L (ug/L) Weekly Grab	Polynuclear Aromatic Hydrocarbons (PAH) Carcinogenic PAHs Micrograms/L (ug/L) Weekly Calculated	Benzofluoranthene Micrograms/L (ug/L) Weekly Grab	Benzofluoranthene (3,4-Benzofluoranthene) Micrograms/L (ug/L) Weekly Grab	Benzofluoranthene (11,12-benzofluoranthene) Micrograms/L (ug/L) Weekly Grab	Chrysene Micrograms/L (ug/L) Weekly Grab	Benzofluoranthene Micrograms/L (ug/L) Weekly Grab
Week	Monitoring Point	DPE	DPE	DPE	DPE	DPE	DPE	DPE	DPE	DPE	DPE	DPE
1-W	8/1/18											
1-Th	8/2/18											
1-F	8/3/18											
1-Sa	8/4/18											
2-Su	8/5/18											
2-M	8/6/18											
2-T	8/7/18	64.90	8.68	B 1	B 250	B 110	B 0.044	B 0.072	B 0.056	B 0.062	B 0.082	B 0.056
2-W	8/8/18											
2-Th	8/9/18											
2-F	8/10/18											
2-Sa	8/11/18											
3-Su	8/12/18											
3-M	8/13/18											
3-T	8/14/18											
3-W	8/15/18	68.40	8.69	B 1	B 250	B 120	B 0.009	B 0.015	B 0.012	B 0.013	B 0.017	B 0.012
3-Th	8/16/18											
3-F	8/17/18											
3-Sa	8/18/18											
4-Su	8/19/18											
4-M	8/20/18											
4-T	8/21/18	0.00	8.80	B 1	B 250	B 130	B 0.010	B 0.016	B 0.013	B 0.014	B 0.018	B 0.013
4-W	8/22/18											
4-Th	8/23/18											
4-F	8/24/18											
4-Sa	8/25/18											
5-Su	8/26/18											
5-M	8/27/18	C	C	C	C	C	C	C	C	C	C	C
5-T	8/28/18											
5-W	8/29/18											
5-Th	8/30/18											
5-F	8/31/18											
Daily Minimum			8.68									
			>= 6.0 (RO)									
Daily Maximum		68.4	8.8	1	250	130	0.044	0.072	0.056	0.062	0.082	0.056
		<= 100 (RO)	<= 9.0 (RO)	<= 16 (RO)	<= 800 (RO)	<= 500 (RO)	<= 0.05 (RO)	Report Only	Report Only	Report Only	Report Only	Report Only

Reporting Codes Used: B - Below Detection Limit/No Detection, C - No Discharge

## Overall DMR Notes/Comment

Sample collected on 8/21/18 but system was not discharging during the week and not restarted. Thus flow rate is listed as no-discharge.



Week	Monitoring Point	Dibenzofuran/fluorene Micrograms/L (ug/L) Weekly Grab	Indeno(1,2,3-cd)pyrene Micrograms/L (ug/L) Weekly Grab
		DPE	DPE
1-W	8/1/18		
1-Th	8/2/18		
1-F	8/3/18		
1-Sa	8/4/18		
2-Su	8/5/18		
2-M	8/6/18		
2-T	8/7/18	B 0.051	B 0.072
2-W	8/8/18		
2-Th	8/9/18		
2-F	8/10/18		
2-Sa	8/11/18		
3-Su	8/12/18		
3-M	8/13/18		
3-T	8/14/18		
3-W	8/15/18	B 0.011	B 0.015
3-Th	8/16/18		
3-F	8/17/18		
3-Sa	8/18/18		
4-Su	8/19/18		
4-M	8/20/18		
4-T	8/21/18	B 0.011	B 0.016
4-W	8/22/18		
4-Th	8/23/18		
4-F	8/24/18		
4-Sa	8/25/18		
5-Su	8/26/18		
5-M	8/27/18	C	C
5-T	8/28/18		
5-W	8/29/18		
5-Th	8/30/18		
5-F	8/31/18		
<b>Daily Minimum</b>			
<b>Daily Maximum</b>		0.051	0.072
		Report Only	Report Only



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Garrick Jauregui

9/25/2018 3:05:04 PM

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Signature

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Date



Permit Number: WA0991007

Permittee: Former Unocal Edmonds Bulk Terminal

Facility County: Snohomish

Receiving Waterbody: Shelleberger Creek

Monitoring Period: 09/01/2018 - 09/30/2018

Outfall: 002 - Willow Creek

Version: 1

Week	Monitoring Point	Flow Gallons/minute (gpm) Weekly Metered/Recorded	pH Standard Units Weekly Grab	Benzene Micrograms/L (ug/L) Weekly Grab	NWTPHGx Gasoline (NWTPH Gx) (volatile) Micrograms/L (ug/L) Weekly Grab	NWTPHDx Diesel (NWTPH Dx) (semi-volatile) Micrograms/L (ug/L) Weekly Grab	Polynuclear Aromatic Hydrocarbons (PAH) Carcinogenic PAHs Micrograms/L (ug/L) Weekly Calculated	Benzo(a)anthracene Micrograms/L (ug/L) Weekly Grab	Benzo(b)fluoranthene (3,4-Benzofluoranthene) Micrograms/L (ug/L) Weekly Grab	Benzo(k)fluoranthene (11,12-benzofluoranthene) Micrograms/L (ug/L) Weekly Grab	Chrysene Micrograms/L (ug/L) Weekly Grab	Benzo(a)pyrene Micrograms/L (ug/L) Weekly Grab
Week	Monitoring Point	DPE	DPE	DPE	DPE	DPE	DPE	DPE	DPE	DPE	DPE	DPE
1-Sa	9/1/18											
2-Su	9/2/18											
2-M	9/3/18											
2-T	9/4/18											
2-W	9/5/18											
2-Th	9/6/18											
2-F	9/7/18											
2-Sa	9/8/18											
3-Su	9/9/18											
3-M	9/10/18											
3-T	9/11/18											
3-W	9/12/18											
3-Th	9/13/18											
3-F	9/14/18											
3-Sa	9/15/18											
4-Su	9/16/18											
4-M	9/17/18											
4-T	9/18/18											
4-W	9/19/18											
4-Th	9/20/18											
4-F	9/21/18											
4-Sa	9/22/18											
5-Su	9/23/18											
5-M	9/24/18											
5-T	9/25/18											
5-W	9/26/18											
5-Th	9/27/18											
5-F	9/28/18											
5-Sa	9/29/18											
6-Su	9/30/18											
Daily Minimum			>= 6.0 (RO)									
Daily Maximum		<= 100 (RO)	<= 9.0 (RO)	<= 16 (RO)	<= 800 (RO)	<= 500 (RO)	<= 0.05 (RO)	Report Only	Report Only	Report Only	Report Only	Report Only

Reporting Codes Used: C - No Discharge

Overall DMR Notes/Comment

Reporting Code: C - No Discharge



Week	Monitoring Point	Dibenzo(a,h)anthracene Micrograms/L (ug/L) Weekly Grab	Indeno(1,2,3-cd)pyrene Micrograms/L (ug/L) Weekly Grab
		DPE	DPE
1-Sa	9/1/18		
2-Su	9/2/18		
2-M	9/3/18		
2-T	9/4/18		
2-W	9/5/18		
2-Th	9/6/18		
2-F	9/7/18		
2-Sa	9/8/18		
3-Su	9/9/18		
3-M	9/10/18		
3-T	9/11/18		
3-W	9/12/18		
3-Th	9/13/18		
3-F	9/14/18		
3-Sa	9/15/18		
4-Su	9/16/18		
4-M	9/17/18		
4-T	9/18/18		
4-W	9/19/18		
4-Th	9/20/18		
4-F	9/21/18		
4-Sa	9/22/18		
5-Su	9/23/18		
5-M	9/24/18		
5-T	9/25/18		
5-W	9/26/18		
5-Th	9/27/18		
5-F	9/28/18		
5-Sa	9/29/18		
6-Su	9/30/18		
Daily Minimum			
Daily Maximum		Report Only	Report Only



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Garrick Jauregui

11/28/2018 2:42:48 PM

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Signature

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Date



Permit Number: WA0991007

Permittee: Former Unocal Edmonds Bulk Terminal

Facility County: Snohomish

Receiving Waterbody: Shelleberger Creek

Monitoring Period: 10/01/2018 - 10/31/2018

Outfall: 002 - Willow Creek

Version: 1

Week	Monitoring Point	Flow Gallons/minute (gpm) Weekly Metered/Recorded	pH Standard Units Weekly Grab	Benzene Micrograms/L (ug/L) Weekly Grab	NWTPHGx Gasoline (NWTPH Gx) (volatile) Micrograms/L (ug/L) Weekly Grab	NWTPHDx Diesel (NWTPH Dx) (semi-volatile) Micrograms/L (ug/L) Weekly Grab	Polynuclear Aromatic Hydrocarbons (PAH) Carcinogenic PAHs Micrograms/L (ug/L) Weekly Calculated	Benz(a)anthracene Micrograms/L (ug/L) Weekly Grab	Benz(b)fluoranthene (3,4-Benzofluoranthene) Micrograms/L (ug/L) Weekly Grab	Benz(k)fluoranthene (11,12-benzofluoranthene) Micrograms/L (ug/L) Weekly Grab	Chrysene Micrograms/L (ug/L) Weekly Grab	Benz(a)pyrene Micrograms/L (ug/L) Weekly Grab
		DPE	DPE	DPE	DPE	DPE	DPE	DPE	DPE	DPE	DPE	DPE
1-M	10/1/18											
1-T	10/2/18											
1-W	10/3/18	C	C	C	C	C	C	C	C	C	C	C
1-Th	10/4/18											
1-F	10/5/18											
1-Sa	10/6/18											
2-Su	10/7/18											
2-M	10/8/18											
2-T	10/9/18											
2-W	10/10/18	57.80	8.50	B 1	B 250	B 110	B 0.009	B 0.014	B 0.011	B 0.012	B 0.016	B 0.011
2-Th	10/11/18											
2-F	10/12/18											
2-Sa	10/13/18											
3-Su	10/14/18											
3-M	10/15/18											
3-T	10/16/18											
3-W	10/17/18											
3-Th	10/18/18	57.60	7.90	B 1	B 250	B 110	B 0.009	B 0.014	B 0.011	B 0.012	B 0.016	B 0.011
3-F	10/19/18											
3-Sa	10/20/18											
4-Su	10/21/18											
4-M	10/22/18											
4-T	10/23/18											
4-W	10/24/18											
4-Th	10/25/18											
4-F	10/26/18	63.40	7.55	B 1	B 250	130	B 0.009	B 0.014	B 0.011	B 0.012	B 0.016	B 0.011
4-Sa	10/27/18											
5-Su	10/28/18											
5-M	10/29/18											
5-T	10/30/18	C	C	C	C	C	C	C	C	C	C	C
5-W	10/31/18											
Daily Minimum			7.55									
			>= 6.0 (RO)									
Daily Maximum		63.4	8.5	1	250	130	0.009	0.014	0.011	0.012	0.016	0.011
		<= 100 (RO)	<= 9.0 (RO)	<= 16 (RO)	<= 800 (RO)	<= 500 (RO)	<= 0.05 (RO)	Report Only	Report Only	Report Only	Report Only	Report Only

Reporting Codes Used: B - Below Detection Limit/No Detection, C - No Discharge





Week	Monitoring Point	Dibenzofuran/fluorene Micrograms/L (ug/L) Weekly Grab	Indeno(1,2,3-cd)pyrene Micrograms/L (ug/L) Weekly Grab
		DPE	DPE
1-M	10/1/18		
1-T	10/2/18		
1-W	10/3/18	C	C
1-Th	10/4/18		
1-F	10/5/18		
1-Sa	10/6/18		
2-Su	10/7/18		
2-M	10/8/18		
2-T	10/9/18		
2-W	10/10/18	B 0.01	B 0.014
2-Th	10/11/18		
2-F	10/12/18		
2-Sa	10/13/18		
3-Su	10/14/18		
3-M	10/15/18		
3-T	10/16/18		
3-W	10/17/18		
3-Th	10/18/18	B 0.01	B 0.014
3-F	10/19/18		
3-Sa	10/20/18		
4-Su	10/21/18		
4-M	10/22/18		
4-T	10/23/18		
4-W	10/24/18		
4-Th	10/25/18		
4-F	10/26/18	B 0.01	B 0.014
4-Sa	10/27/18		
5-Su	10/28/18		
5-M	10/29/18		
5-T	10/30/18	C	C
5-W	10/31/18		
<b>Daily Minimum</b>			
<b>Daily Maximum</b>		0.01	0.014
		Report Only	Report Only



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Garrick Jauregui

11/28/2018 2:42:51 PM

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**Signature**

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**Date**



Permit Number: WA0991007

Permittee: Former Unocal Edmonds Bulk Terminal

Facility County: Snohomish

Receiving Waterbody: Shelleberger Creek

Monitoring Period: 11/01/2018 - 11/30/2018

Outfall: 002 - Willow Creek

Version: 3

Week	Monitoring Point	Flow Gallons/minute (gpm) Weekly Metered/Recorded	pH Standard Units Weekly Grab	Benzene Micrograms/L (ug/L) Weekly Grab	NWTPHGx Gasoline (NWTPH Gx) (volatile) Micrograms/L (ug/L) Weekly Grab	NWTPHDx Diesel (NWTPH Dx) (semi-volatile) Micrograms/L (ug/L) Weekly Grab	Polynuclear Aromatic Hydrocarbons (PAH) Carcinogenic PAHs Micrograms/L (ug/L) Weekly Calculated	Benzo(a)anthracene Micrograms/L (ug/L) Weekly Grab	Benzo(b)fluoranthene (3,4-Benzofluoranthene) Micrograms/L (ug/L) Weekly Grab	Benzo(k)fluoranthene (11,12-benzofluoranthene) Micrograms/L (ug/L) Weekly Grab	Chrysene Micrograms/L (ug/L) Weekly Grab	Benzo(a)pyrene Micrograms/L (ug/L) Weekly Grab
Week	Monitoring Point	DPE	DPE	DPE	DPE	DPE	DPE	DPE	DPE	DPE	DPE	DPE
1-Th	11/1/18											
1-F	11/2/18											
1-Sa	11/3/18											
2-Su	11/4/18											
2-M	11/5/18											
2-T	11/6/18											
2-W	11/7/18	68.00	7.81	<1	<250	J 76	<0.009	<0.015	<0.011	<0.012	<0.017	<0.011
2-Th	11/8/18											
2-F	11/9/18											
2-Sa	11/10/18											
3-Su	11/11/18											
3-M	11/12/18											
3-T	11/13/18	61.80	8.66	<1	<100	<250	<0.044	<0.072	<0.056	<0.062	<0.082	<0.056
3-W	11/14/18											
3-Th	11/15/18											
3-F	11/16/18											
3-Sa	11/17/18											
4-Su	11/18/18											
4-M	11/19/18											
4-T	11/20/18											
4-W	11/21/18	58.80	7.86	<1	<250	<170	<0.009	<0.014	<0.011	<0.012	<0.016	<0.011
4-Th	11/22/18											
4-F	11/23/18											
4-Sa	11/24/18											
5-Su	11/25/18											
5-M	11/26/18	C	C	C	C	C	C	C	C	C	C	C
5-T	11/27/18											
5-W	11/28/18											
5-Th	11/29/18											
5-F	11/30/18											
Daily Minimum			7.86 ≥ 6.0 (RO)									
Daily Maximum		68 ≤ 100 (RO)	8.66 ≤ 9.0 (RO)	<1 ≤ 16 (RO)	<250 ≤ 800 (RO)	<250 ≤ 500 (RO)	<0.044 ≤ 0.05 (RO)	<0.072 Report Only	<0.056 Report Only	<0.062 Report Only	<0.082 Report Only	<0.056 Report Only

Reporting Codes Used: B - Below Detection Limit/No Detection, C - No Discharge, J - Estimated Value/Below Quantitation Limit



Week	Monitoring Point	Dibenzo(a,h)anthracene Micrograms/L (ug/L) Weekly Grab	Indeno(1,2,3-cd)pyrene Micrograms/L (ug/L) Weekly Grab
		DPE	DPE
1-Th	11/1/18		
1-F	11/2/18		
1-Sa	11/3/18		
2-Su	11/4/18		
2-M	11/5/18		
2-T	11/6/18		
2-W	11/7/18	<0.1	<0.015
2-Th	11/8/18		
2-F	11/9/18		
2-Sa	11/10/18		
3-Su	11/11/18		
3-M	11/12/18		
3-T	11/13/18	<0.051	<0.072
3-W	11/14/18		
3-Th	11/15/18		
3-F	11/16/18		
3-Sa	11/17/18		
4-Su	11/18/18		
4-M	11/19/18		
4-T	11/20/18		
4-W	11/21/18	<0.1	<0.014
4-Th	11/22/18		
4-F	11/23/18		
4-Sa	11/24/18		
5-Su	11/25/18		
5-M	11/26/18	C	C
5-T	11/27/18		
5-W	11/28/18		
5-Th	11/29/18		
5-F	11/30/18		
Daily Minimum			
Daily Maximum		<0.1 Report Only	<0.072 Report Only



*I certify under penalty of law, that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.*

Garrick Jauregui

4/4/2019 1:00:00 PM

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**Signature**

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**Date**



Permit Number: WA0991007

Permittee: Former Unocal Edmonds Bulk Terminal

Facility County: Snohomish

Receiving Waterbody: Shelleberger Creek

Monitoring Period: 12/01/2018 - 12/31/2018

Outfall: 002 - Willow Creek

Version: 1

Week	Monitoring Point	Flow	pH	Benzene	NWTPHGx	NWTPHDx	Polynuclear Aromatic Hydrocarbons (PAH)	Benzofluoranthene	Benzofluoranthene	Chrysene	Benzofluoranthene	Benzofluoranthene
		gpm Weekly Metered/Recorded	Standard Units Weekly Grab	Micrograms/L (ug/L) Weekly Grab	Micrograms/L (ug/L) (volatile) Weekly Grab	Micrograms/L (ug/L) Weekly Grab	Micrograms/L (ug/L) Weekly Calculated	Micrograms/L (ug/L) Weekly Grab	Micrograms/L (ug/L) Weekly Grab	Micrograms/L (ug/L) Weekly Grab	Micrograms/L (ug/L) Weekly Grab	Micrograms/L (ug/L) Weekly Grab
		DPE	DPE	DPE	DPE	DPE	DPE	DPE	DPE	DPE	DPE	DPE
1-Sa	12/1/18	C	C	C	C	C	C	C	C	C	C	C
2-Su	12/2/18											
2-M	12/3/18											
2-T	12/4/18											
2-W	12/5/18											
2-Th	12/6/18	C	C	C	C	C	C	C	C	C	C	C
2-F	12/7/18											
2-Sa	12/8/18											
3-Su	12/9/18											
3-M	12/10/18	58.80	7.38	B 1	B 250	B 110	B 0.044	B 0.071	B 0.056	B 0.061	B 0.081	B 0.056
3-T	12/11/18											
3-W	12/12/18											
3-Th	12/13/18											
3-F	12/14/18											
3-Sa	12/15/18											
4-Su	12/16/18											
4-M	12/17/18											
4-T	12/18/18											
4-W	12/19/18											
4-Th	12/20/18	48.09	7.51	B 1	J 150	J 98	B 0.044	B 0.071	B 0.056	B 0.061	B 0.081	B 0.056
4-F	12/21/18											
4-Sa	12/22/18											
5-Su	12/23/18											
5-M	12/24/18											
5-T	12/25/18											
5-W	12/26/18											
5-Th	12/27/18	53.20	7.51	B 1	B 250	J 91	B 0.009	B 0.014	B 0.011	B 0.012	B 0.017	B 0.011
5-F	12/28/18											
5-Sa	12/29/18											
6-Su	12/30/18											
6-M	12/31/18											
Daily Minimum			7.38									
			>= 6.0 (RO)									
Daily Maximum		58.8	7.51	1	250	110	0.044	0.071	0.056	0.061	0.081	0.056
		<= 100 (RO)	<= 9.0 (RO)	<= 16 (RO)	<= 800 (RO)	<= 500 (RO)	<= 0.05 (RO)	Report Only	Report Only	Report Only	Report Only	Report Only

Reporting Codes Used: B - Below Detection Limit/No Detection, C - No Discharge, J - Estimated Value/Below Quantitation Limit



Week	Monitoring Point	Dibenzofuran/fluorene Micrograms/L (ug/L) Weekly Grab	Indeno(1,2,3-cd)pyrene Micrograms/L (ug/L) Weekly Grab
		DPE	DPE
1-Sa	12/1/18	C	C
2-Su	12/2/18		
2-M	12/3/18		
2-T	12/4/18		
2-W	12/5/18		
2-Th	12/6/18	C	C
2-F	12/7/18		
2-Sa	12/8/18		
3-Su	12/9/18		
3-M	12/10/18	B 0.051	B 0.071
3-T	12/11/18		
3-W	12/12/18		
3-Th	12/13/18		
3-F	12/14/18		
3-Sa	12/15/18		
4-Su	12/16/18		
4-M	12/17/18		
4-T	12/18/18		
4-W	12/19/18		
4-Th	12/20/18	B 0.051	B 0.071
4-F	12/21/18		
4-Sa	12/22/18		
5-Su	12/23/18		
5-M	12/24/18		
5-T	12/25/18		
5-W	12/26/18		
5-Th	12/27/18	B 0.01	B 0.014
5-F	12/28/18		
5-Sa	12/29/18		
6-Su	12/30/18		
6-M	12/31/18		
<b>Daily Minimum</b>			
<b>Daily Maximum</b>		0.051	0.071
		Report Only	Report Only



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Garrick Jauregui

1/16/2019 2:57:18 PM

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Signature

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Date